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Mineral Resource Report 74
1977

A es and Measured Sections of Pennsylvania Bituminous Coals

Part III

Viktoras W. Skema
William E. Edmunds
Albert D. Glover
Jon D. Inners
Mark A. Sholes

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF
TOPOGRAPHIC AND GEOLOGIC SURVEY
Arthur A. Socolow, State Geologist

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Mineral Resource Report 74

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Part III

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PENNSYLVANIA GEOLOGICAL SURVEY
FOURTH SERIES
HARRISBURG

1977

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PREFACE

This publication is part of a continuing investigation of coal resources in the bituminous coal region of Pennsylvania by the Pennsylvania Geological Survey. The information presented on coal and associated rock units was gathered in the period 1975-76. Similar reports were published earlier: Mineral Resource Report 66, containing data collected in 1966-68; and Mineral Resource Report 69, containing data collected in 1969-74.

These reports are beneficial to all concerned with coal development and land use planning of coal-bearing areas. The data on coal, particularly thickness, chemical analysis, and coking and fusibility characteristics, should be helpful for preliminary evaluation of the potential use of specific coal seams. The lithologic, paleontologic, mineralogic, and structural information should also be generally useful to geologists for stratigraphic correlation and for sedimentary, structural, and other studies. In addition, the report contains information relevant to environmental and engineering studies dealing with such problems as pollution control, engineering construction, efficient mining technology, and urban or rural planning. The previously published Mineral Resource Report 66 contains a brief discussion of some specific applications of the geologic data in these reports to engineering and environmental problems.

The emphasis in this report is on coal characteristics; however, an attempt is made to include other data pertinent to the needs of those concerned with the Pennsylvanian and Permian part of the stratigraphic sequence. This series of publications should benefit a wide audience, particularly since a great deal of the information was collected from surface strip mines that have been backfilled and are now inaccessible.

ACKNOWLEDGEMENTS

The authors of this report wish to acknowledge the service and cooperation of the U.S. Bureau of Mines and the U.S. Geological Survey in providing us with the chemical analyses so vital to this report. Special thanks are offered to Curtis Edgerton and Allan T. Schmidt of the U.S. Bureau of Mines and Jack H. Medlin and S. Lynn Coleman of the U.S. Geological Survey, who helped coordinate this joint project. We also recognize the expertise of the following people: Charles S. Annell, A. J. Bartel, F. Brown, J. W. Brown, J. Budinsky, J. L. Harris, P. Hemming, J. O. Johnson, H. Kirschenbaum, R. J. Knight, B. McCall, L. Mei, H. T. Millard, Jr., J. O'Kelley, Jack J. Rowe, Louis J. Schwarz, F. O. Simon, R. E. Van Loenen, J. S. Wahlberg, and R. White of the U.S. Geological Survey's Branch of Analytical Laboratories; and the chemists in the Coal Analysis Section of the U.S. Bureau of Mines headed by Forrest E. Walker. We appreciate the important part they had in this project. Much of the field work for this project, the coal sampling and description of geologic features, was done by three student assistants, Daniel Gabler, John C. Hempel, and Richard V. Reardon, during the summer of 1975. Their efforts enabled us to collect a great deal of the data available during a very active period of coal mining. Finally, we wish to thank the bituminous coal operators of Pennsylvania for their courtesy in allowing us access to the mines visited.

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ABSTRACT

Geologic information concerning bituminous coals and associated sedimentary rocks, obtained from strip mines and a few drill holes in 20 counties of western Pennsylvania, is presented. Coal data include seam and bench thickness, megascopic description of composition, proximate and ultimate analyses, major-, minor-, and trace-element analyses, determination of Btu and forms of sulfur, free-swelling index, and ash-softening temperature. Other data presented are thickness of individual rock units, lithologic characteristics (gross composition, grain size, color, etc.), degree of weathering, fossil content, sedimentary structures, bedding and fracture orientation, and overburden characteristics.

INTRODUCTION

HISTORY AND PURPOSE

The area included in this report, the western and north-central portion of Pennsylvania, is an area rich in bituminous coal resources. For the past 40 years much of this coal has been mined by open-pit stripping methods. These strip mines have been a very accessible source of important geologic information. Within the past 12 years, however, immediate backfilling of these open-pit mines has been made mandatory as a conservation measure. Consequently, much potentially valuable geologic information has quickly become irretrievable. Recognizing this situation, the Pennsylvania Geological Survey in 1966 initiated a continuing project of collecting the temporarily available information. In this project, detailed examinations of strip-mine highwalls are made, and sedimentologic, paleontologic, mineralogic, and structural features are described. Coal is described megascopically, sampled, and sent to the U.S. Bureau of Mines for a proximate and ultimate analysis, and a determination of Btu, fusibility temperature, and free-swelling index. The results for the proximate and ultimate analysis are presented on an as-received, a moisture-free, and a moisture- and ash-free basis.

A more detailed chemical analysis was performed by the U.S. Geological Survey on 124 samples collected in the summer of 1975. This included a quantitative determination of 24 major, minor, and trace elements along with a semiquantitative analysis for 48 other trace elements. Concentrations of most of these elements were determined by analysis of ash. The exceptions were the elements As, F, Hg, Sb, Se, Th, and U, which were determined by analyzing air-dried samples (Figure 1). Most of these 124 samples were also tested by the U.S. Bureau of Mines for standard proximate and ultimate analyses along with the other properties previously mentioned. The forms of sulfur present were also determined.

All of this information is stored at the Pennsylvania Survey in a general stratigraphic file and a coal analysis file which are open to the public. Other stratigraphic data not related to this project, such as drill-hole core logs, are also maintained in this open file.

Publication of the data obtained in this project (along with some drill-hole data which include coal analyses) will make the information more readily available to a wide public audience. However, because of publication space limitations, information about rocks other than coal is summarized or abbreviated. Chemical analysis of coal is given only on an as-received basis, and of the three fusibility temperatures obtained in testing, the initial deformation and fluid temperatures are omitted. The data on forms of sulfur are also omitted. All other coal information is published.

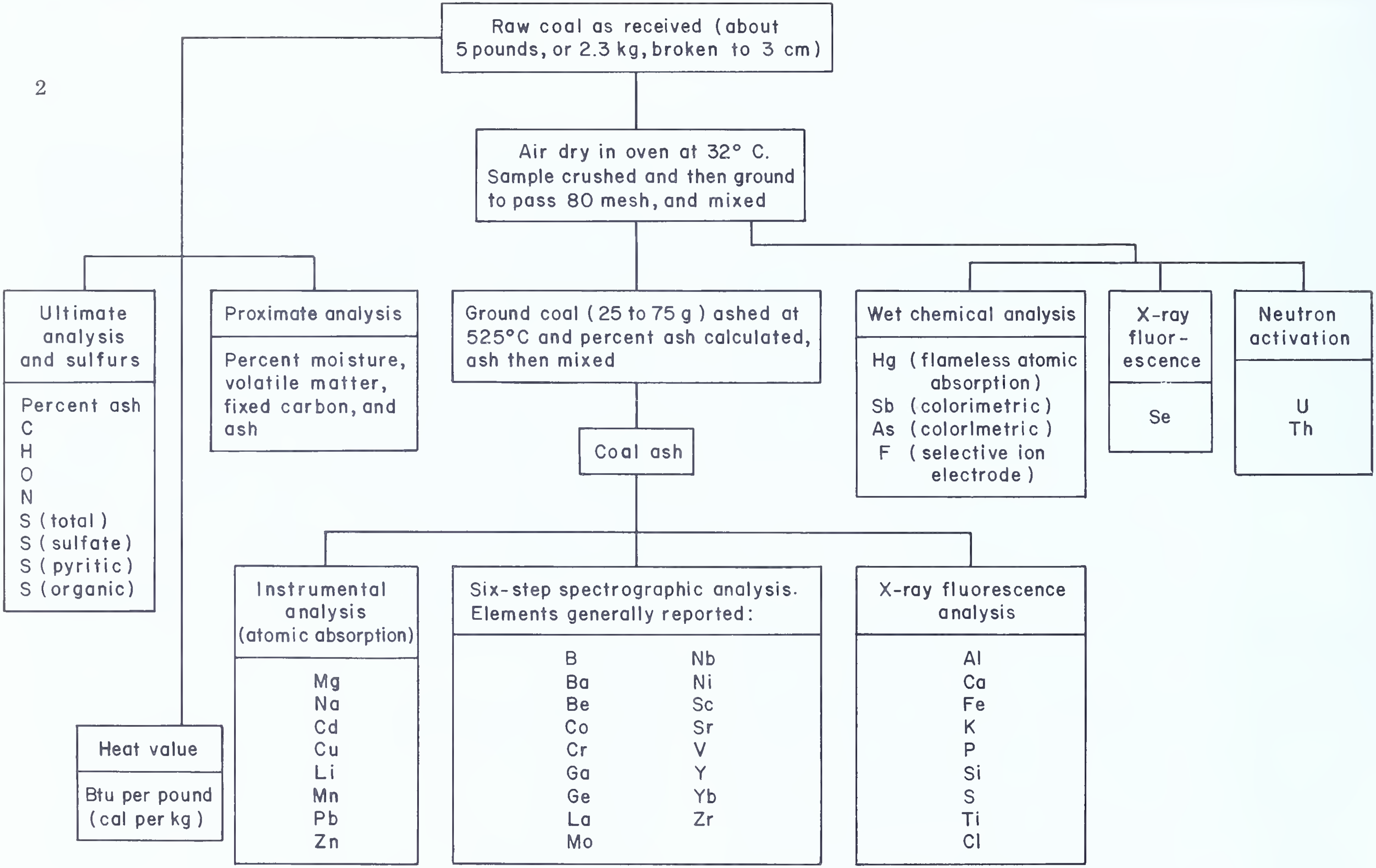
Raw coal as received (about 5 pounds, or 2.3 kg, broken to 3 cm)
Air dry in oven at 32° C. Sample crushed and then ground to pass 80 mesh, and mixed
Ultimate analysis and sulfurs
Percent ash
C
H
O
N
S (total)
S (sulfate)
S (pyritic)
S (organic)
Proximate analysis
Percent moisture, volatile matter, fixed carbon, and ash
Ground coal (25 to 75 g) ashed at 525°C and percent ash calculated, ash then mixed
Coal ash
Wet chemical analysis
Hg (flameless atomic absorption)
Sb (colorimetric)
As (colorlmetric)
F (selective ion electrode)
X-ray fluor-escence
Se
Neutron activation
U
Th
Heat value
Btu per pound (cal per kg)
Instrumental analysis (atomic absorption)
Mg
Na
Cd
Cu
Li
Mn
Pb
Zn
Six-step spectrographic analysis. Elements generally reported:
B
Ba
Be
Co
Cr
Ga
Ge
La
Mo
Nb
Ni
Sc
Sr
V
Y
Yb
Zr
X-ray fluorescence analysis
Al
Ca
Fe
K
P
Si
S
Ti
Cl

Figure 1. Flow chart showing sequence of sample preparation and chemical analysis (adapted from Swanson and Huffman, 1976).

LOCATION OF AREA

Bituminous coal in Pennsylvania is found mainly in the Appalachian Plateaus province, which is located in the western and northern part of Pennsylvania. There are three coal fields in this province: the Main Bituminous field, which yields the major production of coal in the commonwealth, the North-Central fields, and the Georges Creek field. Bituminous coal is also found in the Broad Top field, which lies in the Valley and Ridge province. Active strip mines in all but the Georges Creek field were visited in 1975-76. The information published here was collected from 20 of the 38 counties in which bituminous coal occurs (Figure 2).

STRATIGRAPHY

The rocks examined in this project are of Pennsylvanian and Permian age. Major rock types other than coal are siltstone, shale, sandstone, and claystone. Limestone occurs as a minor constituent in this sequence of sedimentary rocks. (The lithologic classification system for clastic rocks used in this report is explained in Table 1.) No attempt has been made here to correlate stratigraphic units. The coal names recorded are those reported by the strip mine operators. A general columnar section which gives the stratigraphic positions of these coals is shown in Figure 3. The coals examined in the Broad Top field and the North-Central fields are shown on separate stratigraphic columnar sections (Figures 4 and 5) because of tenuous correlation between them and the coals in the Plateau fields.

Table 1. *Lithologic Classification by Fissility and Grain Size*
(after Berg and Edmunds, Pa. Geol. Survey)

	BEDDING FISSILITY	
Dominant grain size	Planes spaced > ½"	Planes spaced < ½"
Granules and larger	Conglomerate	
Sand	Sandstone	Fissile sandstone
Interlaminated sand and silt	Sand-silt laminite	Sand-silt laminite shale
Silt	Siltstone	Silt shale
Interlaminated silt and clay	Silt-clay laminite	Silt-clay laminite shale
Clay	Claystone	Clay shale

SAMPLING PROCEDURE

Coal samples for chemical analysis were collected whenever possible by using a simple channel sampling procedure. A representative vertical section of the coal seam was selected and cleaned off to expose a fresh face of unweathered coal. Coals that had been exposed to the atmosphere long enough to become deeply weathered were not sampled. A sample of approximately 2 pounds (5 pounds for U.S. Geological Survey samples) was taken from top to bottom of each bench in the seam. Care was taken to exclude partings

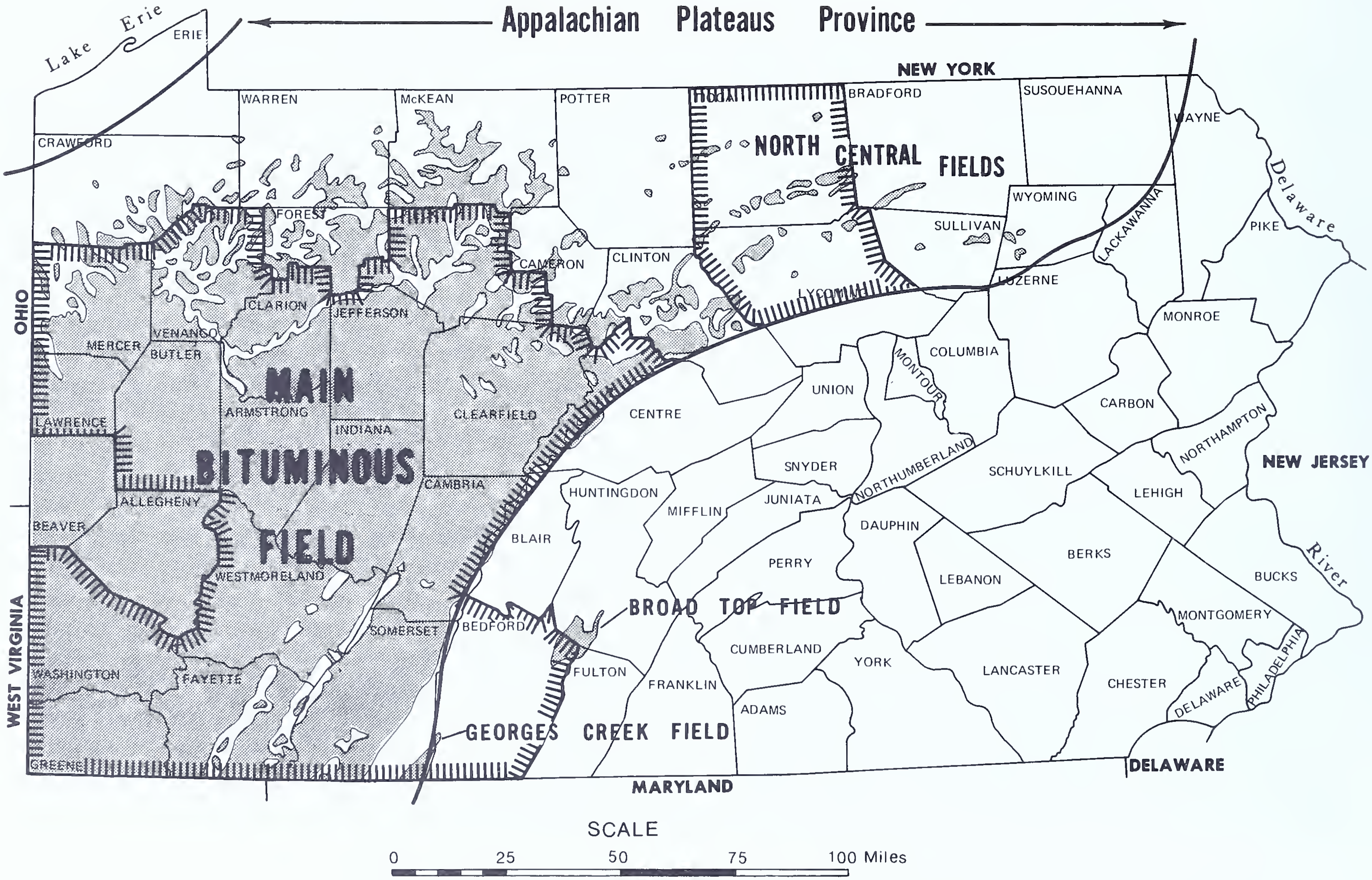

Figure 2. Location of area and distribution of bituminous coal fields.

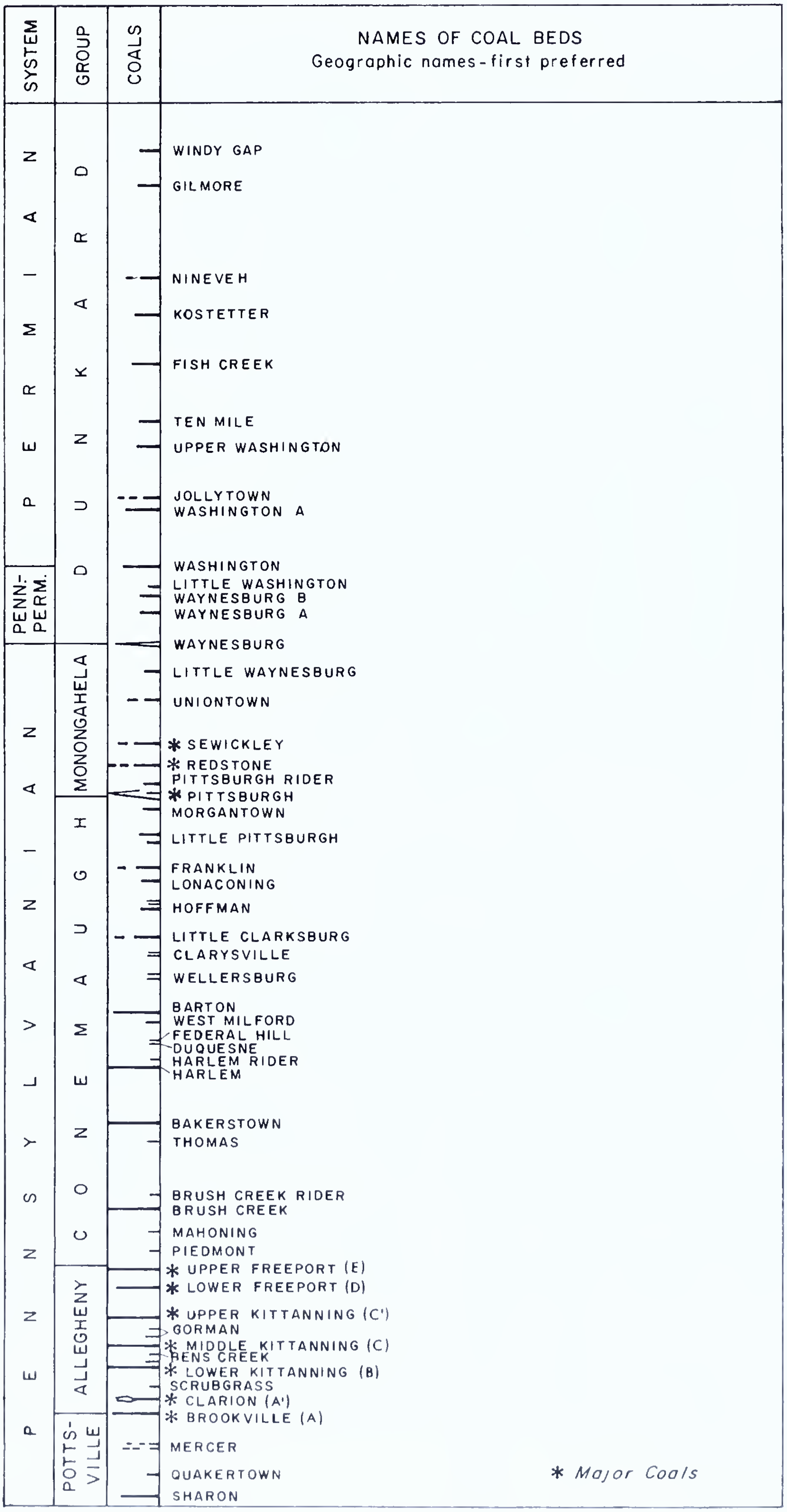

Figure 3. Coal in the main bituminous fields of Pennsylvania.

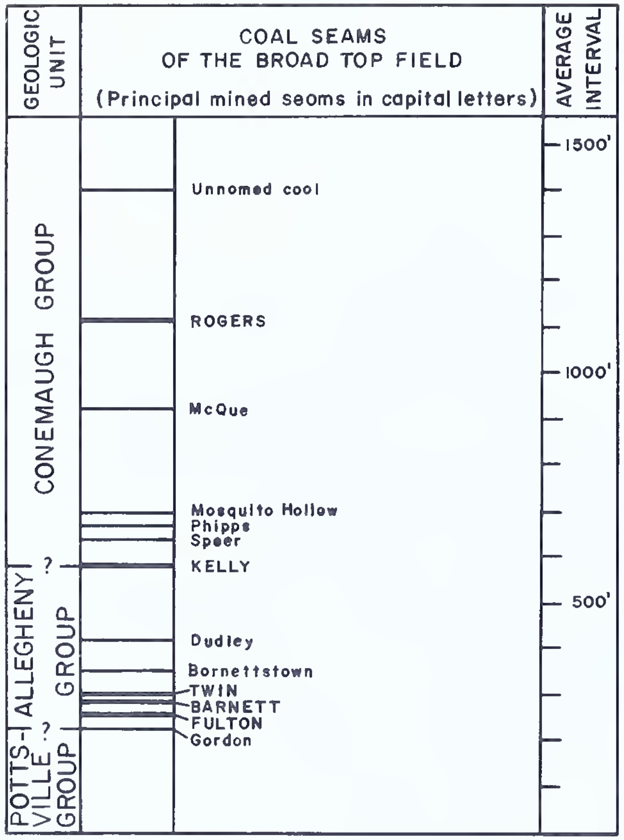

Figure 4. Coal seams of the Broad Top field.

between benches sampled and to exclude any of the rock from above and below the coal. Mineralized lenses and concretions (such as sulfur and siderite) were included in the sample if they appeared to be a persistent component of the bench. The sample was then broken up into approximately 1-inch pieces and placed in a waterproof plastic bag. Samples were generally not in storage longer than two months before shipment for testing. Laboratory testing was performed by the U.S. Bureau of Mines using U.S.B.M. testing standards, and by the U.S. Geological Survey for determination of major-, minor-, and trace-element content.

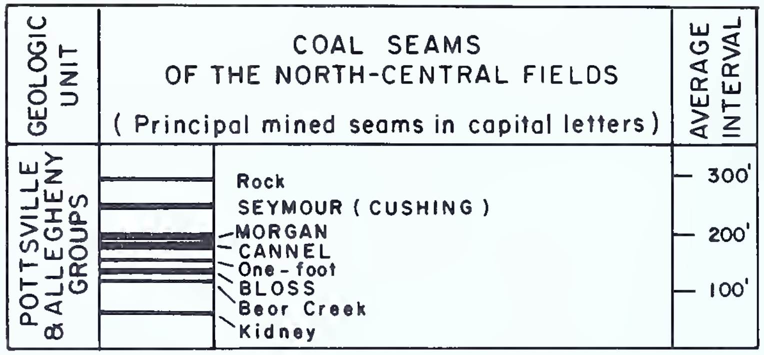
GEOLOGIC UNIT
COAL SEAMS OF THE NORTH-CENTRAL FIELDS
(Principal mined seams in capital letters)
AVERAGE INTERVAL
POTTSVILLE & ALLEGHENY GROUPS
Rock
SEYMOUR (CUSHING)
MORGAN
CANNEL
One - foot
BLOSS
Bear Creek
Kidney
300'
200'
100'

Figure 5. Coal seams of the North-Central fields.

GLOSSARY

Ash: The inorganic residue remaining after ignition of combustible substances in coal. The ash content is determined quantitatively by a definite method prescribed by the American Society for Testing and Materials.

Ash-softening temperature: The temperature at which a coal sample passes through a certain defined stage of fusion when heated at specified conditions as prescribed by the American Society for Testing and Materials.

Banded coal: The common variety of bituminous coal that is composed of a sequence of irregularly alternating layers or lenses of bright vitrain, moderately bright to dull attrital coal (clarain and durain), and soft, powdery fusain.

Bench: Subdivision of a coal based on lithology, partings, and/or minability.

Blossom (of coal): An extremely weathered coal of indeterminate thickness.

Bone (or bony) coal: Coal that has high ash content. It is hard, compact, and contains between 25 and 50 percent ash.

Channel sample: A coal sample obtained by cutting a groove across and perpendicular to the entire thickness of a coal bench being sampled.

Clarain: The microscopically recognizable bright lustrous constituent of coal that, in contrast to vitrain, has fine dull striations. It is intermediate in luster between vitrain and durain.

Durain: The dull constituent of coal characterized by a gray to brownish-black color and a granular texture.

Fixed carbon: That part of the carbon that remains when coal is heated in a closed vessel until the volatile matter is driven off. In a proximate analysis the amount is obtained by subtracting from 100 the sum of the percentages of moisture, volatile matter, and ash.

Flint clay: A very hard, dense variety of claystone with very little plasticity and a conchoidal fracture. It is economically important as a refractory clay.

Free-swelling index: An indication of a coal's ability to coke, or bind together, when a sample is heated in a prescribed manner. It should not be regarded as a method for determining expansion of coals in coke ovens. The higher the index number the better the coking ability.

Fusain: A black to gray-black, fibrous, extremely friable constituent of coal; has a silky luster.

Moisture: The moisture of a coal calculated by establishing the loss in weight (as a percent of the total weight) when a sample is heated under rigidly controlled conditions as prescribed by the American Society for Testing and Materials. The analyses published in this report were conducted on an as-received basis. Samples were not air dried prior to analysis. Consequently, surface moisture may be included with the inherent moisture of the coal.

Parting: A generally thin layer of rock, pyrite, or fusain in, or separating, benches of a coal seam.

Proximate analysis: The determination, by prescribed methods, of moisture, volatile matter, fixed carbon (by difference), and ash.

Rider coal: A thin coal seam above a minable seam.

Rootworked: An adjective applied to an ancient soil that has evidence of roots or root action; commonly a clay.

Seam: A bed, vein, or series of beds of coal.

Seat earth: Rocks of any composition that have undergone weathering and/or the effects of the activities of plants (rootworking) during or shortly after their initial deposition.

Stigmaria: The subaerial portions of such Carboniferous plants as sigillarids and lepidodendrons. They are not technically considered roots; however, they are often referred to as such in the seat earths.

Sulfate (sulfur) bloom: A sulfate oxidation product of a sulfide occurring on exposed coal surfaces.

Ultimate analysis: The determination, in coal, of carbon, hydrogen, sulfur, nitrogen, and ash, and the estimation of oxygen by difference.

Underclay: Layer of claystone lying immediately beneath a coal bed. It usually shows signs of rootworking and often contains fossil roots or *Stigmaria*.

Vitrain: The well-defined bands of coal with brilliant vitreous luster and conchoidal fracture.

Volatile matter: Those products, exclusive of moisture, given off by a material as gas or vapor, determined by heating the coal sample under rigidly controlled conditions, measuring the weight loss, and correcting for moisture.

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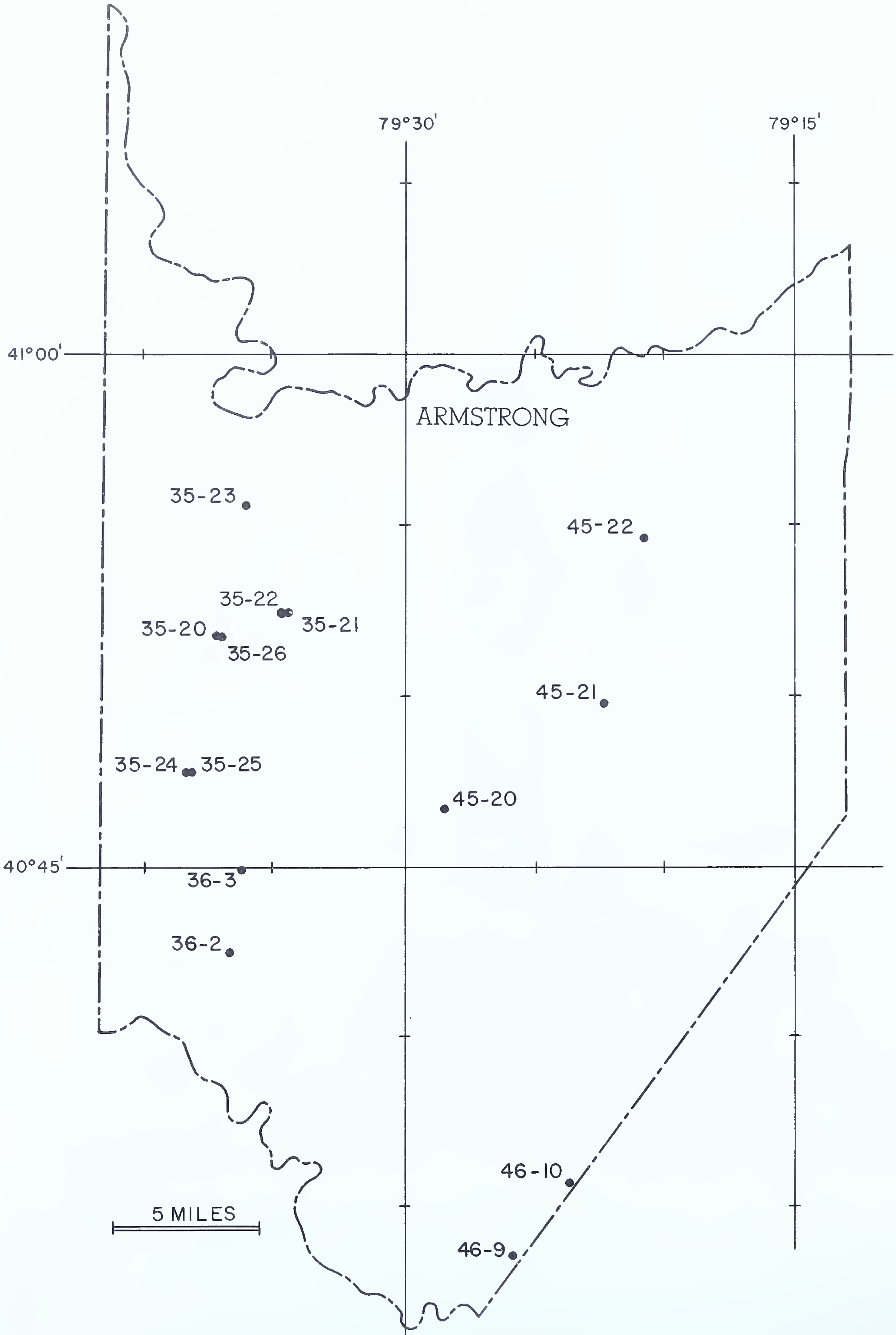
DATA SHEETS


79°30'
79°15'
41°00'
40°45'
ARMSTRONG
35-23
45-22
35-22
35-21
35-20
35-26
45-21
35-24
35-25
45-20
36-3
36-2
46-10
5 MILES
46-9

SITE/STATION NO. 35-20	COUNTY: Armstrong		COAL SAMPLE NO(S).: 405144/793725/2A, 405144/793725/2B
COMPANY: West Freedom Mining Co.	LAT. °N: 40°51'44"	ELEV. (base lower coal): 1172'	
MINE: Strip mine	LONG. °W: 79°37'25"	TWP.: West Franklin	
PERMIT: 68-29	GEOLOGIST: Reardon	15' QUADRANGLE: Kittanning	JOINTING: Coal cleat: N56W, 87NE; N54W, 89NE (½"-2" spacing); N34E, 88NW: N45E, vert. (<½" spacing). Strike and dip on coal: N60W, 1NE.
SAMPLING METHOD: Channel	DATE: 6-10-75	7 1/2' QUADRANGLE: Kittanning	
REPORTED COAL NAMES: Clarion			WEATHERING: Fresh

STRATIGRAPHIC DATA / COAL ANALYSIS

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded(B), Non-Bonded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	VITRAIN ABUNDANCE 30-60%	VITRAIN ABUNDANCE 15-30%	VITRAIN ABUNDANCE < 15%	VITRAIN THICKNESS > 5 mm	VITRAIN THICKNESS 2-5mm	VITRAIN THICKNESS 1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	PROXIMATE (%) VOLATILE MATTER	PROXIMATE (%) FIXED CARBON	PROXIMATE (%) ASH	ULTIMATE (%) HYDROGEN	ULTIMATE (%) CARBON	ULTIMATE (%) NITROGEN	ULTIMATE (%) OXYGEN	ULTIMATE (%) SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
30+	Claystone			Dk gy																						Bands of siderite up to 0.1' thick.
3.3	Coal	1.4	S	Bk	B		X	X			X	X	M	1.2	32.8	48.2	17.8	4.7	63.1	0.6	5.2	8.6	11610	5½	2070	Heavy iron staining. Band of pyrite at base. For trace element analysis, see sample #405144/793725/2B.
	Coal	1.9		Bk	B	X	X				X	X	MB	1.4	36.3	48.8	13.5	4.2	66.6	1.0	8.6	6.1	12180	8	2110	Abundant pyrite lenses and streaks. Heavy iron staining. For trace element analysis, see sample #405144/793725/2A.
	Claystone		S	Md gy																						

SITE/STATION NO. 35-21	COUNTY: Armstrong		COAL SAMPLE NO(S).: 405223/793439/2A, 405223/793439/2B, 405223/793439/2C
COMPANY: B & G Coal Co.	LAT. °N: 40°52'23"	ELEV. (base lower coal): 1186'	
MINE: Strip mine	LONG. °W: 79°34'39"	TWP.: East Franklin	
PERMIT: 25-7	GEOLOGIST: Reardon	15' QUADRANGLE: Kittanning	JOINTING: Coal cleat: N56W, vert.; N61W, vert. (face, ½"-2" spacing); N28E, 83NE; N31E, 8NE (butt). Strike and dip on coal: N75E, 2SE.
SAMPLING METHOD: Channel	DATE: 6-15-75	7 1/2' QUADRANGLE: Kittanning	
REPORTED COAL NAMES: Upper Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
4.0+	Sandstone			Lt gy																						
4.2	Sand-silt laminite		U	Lt gy																						
11.2	Silt-clay laminite		G	Md gy																						
0.4	Claystone		G	Dk gy																						Plant fossils.
3.8	Coal	0.9	S	Bk	B			X	X				D	2.7	34.6	55.0	7.7	5.2	74.6	1.3	8.8	2.4	13340	7½	2280	Band of pyritic shale at base (<1" thick).
	Coal	1.5		Bk	B			X			X	X	M	3.5	34.1	50.4	12.0	5.0	69.9	1.3	9.8	2.0	12570	7½	2910+	Black shale parting at base (<0.1' thick).
	Coal	1.4		Bk	B				X		X	X	MD	3.6	31.8	50.7	13.9	4.9	68.0	1.3	10.1	1.8	12230	8	2910+	Shaly coal at base (0.1' thick).
	Claystone		S	Dk gy																						Abundant plant fossils.

SITE/STATION NO. 35-22
COMPANY: B & G Coal Co.
MINE: Strip mine
PERMIT: 25-7
SAMPLING METHOD: Channel
REPORTED COAL NAMES:

COUNTY: Armstrong
LAT. °N: 40°52'25"
LONG. °W: 79°34'54"
GEOLOGIST: Skema
DATE: 6-76

ELEV. (base lower coal):
TWP.: East Franklin
15' QUADRANGLE: Kittanning
7 1/2' QUADRANGLE: Kittanning

COAL SAMPLE NO(S).: 405225/793454/2-, 405225/793454
JOINTING: Coal cleat (lower coal): N41W, vert. (face), N44E, vert. (butt). Jointing above lower coal: N9W, vert. N44E, vert.; N53W, vert. Strike and dip on coal: N33E, 2SE; N2[illegible]E, [illegible]SE.
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
15.0±	Sandstone		S	Lt gy																						Top inaccessible.
10.0	Clayey silt shale		S	Lt ol gy to dk gy																						Thin dark clay laminae common. Few plant fragments.
0.7	Clay shale		S	Gy bk to dk gy																						Very fissile. Very thin vitrain laminae rare.
4.1	Coal		S	Bk	B		X				X	X	M	2.5	33.6	51.6	12.3	5.1	70.4	1.3	8.6	2.3	12670	8½	2625	Pyrite laminae common (1/32"-1/4" thick; 5'-10' long). Top 0.3' somewhat bony.
3.0	Limestone		S	Blue gy																						
15±	Silty claystone		S	Md dk gy																						Subfissile. Rootworked. Only upper 10' accessible.
4±	Sandstone		S	Lt gy																						Inaccessible.
35±	Claystone		G	Gy bk to dk gy																						Few silt laminae 1/32"-1/4". All but bottom 5' inaccessible.
0.5	Carbonaceous clay shale		S	Bk																						Rare plant fragments.
5.0	Coal	0.3	S	Bk	B				X			X	D													Nearly nonbanded; hard.
	Coal	4.7	S	Bk	B		X				X	X	MB	2.5	25.4	67.5	4.6	5.5	77.9	1.6	8.1	2.3	14070	8	2095	Few pyrite beds (1/32"-1/4" thick; up to 10' long).
1.5+	Claystone			Md dk gy																						Rootworked.

SITE/STATION NO. 35-23 (page 1)	COUNTY: Armstrong		COAL SAMPLE NO(S).: 405532/793606/2A, 2C, 4, 6A, 6B
COMPANY: Hawk Bros.	LAT. °N: 40°55'32"	ELEV. (base lower coal): 1403'	
MINE: Strip mine	LONG. °W: 79°36'06"	TWP.: Sugar Creek	
PERMIT: 121-14	GEOLOGIST: Skema	15' QUADRANGLE: Kittanning	JOINTING: Coal cleat: N42W, vert. (face); N39E, vert. (butt). Jointing above coal: N28E, vert.; N60W, vert.
SAMPLING METHOD: Channel	DATE: 6-23-76	7 1/2' QUADRANGLE: East Brady	
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Bonded (N), or Mixed (M)	> 60 %	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
7±	Sand-silt laminite		S																							Inaccessible.
2±	Sandstone		S																							Inaccessible.
3±	Sand-silt laminite		S																							Inaccessible.
2±	Sandstone		S																							Appears silty. Inaccessible.
12±	Sand-silt laminite		S	Lt gy Md dk gy																						Planar bedding. Siltstone is very clayey and appears shaly in places. Top inaccessible.
3.4	Claystone		S	Md dk gy to dk gy																						Few lighter colored clay laminae (1/16"-1/4" thick). Rare lenses of pyrite (small, well-formed crystals).
5.95	Carbonaceous clay shale	0.1	S	Bk to gy bk																						Vitrain laminae common (1/32"-1/16" thick).
	Coal	0.5	S	Bk	B				X			X	MD	2.2	27.4	43.4	27.0	4.4	57.4	1.1	7.8	2.3	10350	2	2780	
	Coal	1.4	S	Bk	B		X			X	X		MB	2.2	37.0	54.2	6.6	5.5	75.7	1.4	8.5	2.3	13650	7½	2115	Pyrite lenses common.
	Clay shale	0.8	S	Md gy to md dk gy																						Rootworked. Very thin vitrain layers common.
	Coal	1.0	S	Bk	B		X					X	MB	2.6	34.2	48.6	14.6	5.1	67.4	1.3	7.9	3.7	12200	6½	2265	
	Carbonaceous clay shale	0.4	S	Gy bk																						Vitrain laminae common (1/32"-1/16").
	Claystone	0.5	S	Md gy																						Rootworked.
	Coal	0.9		Bk	B			X			X	X	M	2.2	33.4	46.9	17.5	4.8	65.2	1.3	8.2	3.0	11860	8	2400	

SITE/STATION NO. 35-23 (page 2)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: ELEV. (base lower coal):	
MINE:	LONG. °W: TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2mm	Clorain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
			S																							
	Pyrite	0.05																								
			S																							
	Coal	0.3		Bk	B		X				X	X	MB	2.6	35.3	49.7	12.4	5.2	70.0	1.3	8.3	2.8	12610	9	2220	Few pyrite lenses (1/4" thick; 6"-12" long). Few pyrite blebs.
			S																							
0.3+	Clay shale	0.3+		Md dk gy																						Vitrain laminae common (~1/32" thick).

SITE/STATION NO. 35-24	COUNTY: Armstrong		COAL SAMPLE NO(S).: 404748/793834/2B
COMPANY: W. Houser Coal Co.	LAT. °N: 40°47'48"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 79°38'34"	TWP.: North Buffalo	
PERMIT: 564-10	GEOLOGIST: Reardon	15' QUADRANGLE: Kittanning	JOINTING: Coal cleat: N66W, vert.; N59W, vert. (>2"
SAMPLING METHOD: Channel	DATE: 6-10-75	7 1/2' QUADRANGLE: Worthington	spacing); N24E, 85SE; N20E, 87SE.
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
18+	Sand-silt laminite			Lt gy																						
	Coal	2.7	U	Bk	B		X	X					D	1.9	34.4	53.0	10.7	5.2	73.2	1.4	7.7	1.8	13090	8½	2460	Shale at base of unit. For trace element analysis, see sample #404748/793834/2B.
3.5	Clay shale	0.1		Dk gy																						Plant stems abundant.
	Coal	0.7		Bk	B			X			X	X	MD													Few streaks of pyrite and few shale partings.
	Claystone			Md dk gy																						Rootworked.

SITE/STATION NO. 35-25	COUNTY: Armstrong		COAL SAMPLE NO(S).: 404748/793833/2A, 404748/793833/2B
COMPANY: W. Houser Coal Co.	LAT. °N: 40°47'48"	ELEV. (base lower coal): 976.1'	
MINE: Strip mine	LONG. °W: 79°38'33"	TWP.: North Buffalo	
PERMIT: 564-10	GEOLOGIST: Reardon	15' QUADRANGLE: Kittanning	JOINTING: Coal cleat: N61W, vert.; N64W, vert.; N21E,
SAMPLING METHOD: Channel	DATE: 6-10-75	7 1/2' QUADRANGLE: Worthington	81SE; N26E, 89SE (½"-2' spacing). Strike and dip on coal:
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Fresh N26W, 3NE

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	COAL: Banded(B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm.	2-5 mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
18+	Sand-silt laminite			Lt gy																						Dominantly sandstone. Fine- to medium-grained sand.
			U																							
3.9	Coal	1.8		Bk	B			X	X				D	1.4	36.4	50.7	11.5	5.0	70.2	1.3	7.6	4.4	12840	8	2450	Thin band of pyrite at base. For trace element analysis, see sample #404748/793833/2B.
	Coal	2.1		Bk	B		X	X			X	X	MD	2.1	34.4	48.7	14.8	5.1	69.3	1.3	7.6	1.9	12430	8½	2530	Pyrite streaks throughout. For trace element analysis, see sample #404748/793833/2A.
			S																							
	Claystone			Md dk gy																						Plant fossils. Rootworked.

SITE/STATION NO.: 35-26	COUNTY: Armstrong		COAL SAMPLE NO(S).: 405144/793728/2A, 405144/793728/2B
COMPANY: West Freedom Mining Co.	LAT. °N: 40°51'44"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 79°37'28"	TWP.: West Franklin	
PERMIT: 68-29	GEOLOGIST: Reardon	15' QUADRANGLE: Kittanning	JOINTING: Coal cleat: N57W, vert.; N51W, vert. (½"-2" spacing); N47E, 87NW; N43E, 86NW.
SAMPLING METHOD: Channel	DATE: 6-10-75	7 1/2' QUADRANGLE: Kittanning	
REPORTED COAL NAMES: Clarion			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
30+	Clay shale			Dk gy																						Bands of siderite up to 0.1' thick.
2.9	Coal	1.0	S	Bk	B	X	X				X	X	MD	1.7	40.6	50.0	7.7	5.4	75.1	1.5	7.8	2.5	13400	7	2120	For trace element analysis, see sample #405144/793728/2B.
	Coal	1.9		Bk	B		X	X			X	X	MD	1.7	36.1	53.1	9.1	5.2	70.7	0.9	9.4	4.7	12860	8	2140	For trace element analysis, see sample #405144/793728/2A.
	Claystone		S	Md gy																						

SITE/STATION NO. 36-2
COMPANY: Rob Coal Co.
MINE: Strip mine
PERMIT: 542-6
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Upper Freeport

COUNTY: Armstrong
LAT. °N: 40°42'25"
LONG. °W: 79°36'45"
GEOLOGIST: Inners & Reardon
DATE: 6-18-75

ELEV. (base lower coal): 982'
TWP.: South Buffalo
15' QUADRANGLE: Freeport
7 1/2' QUADRANGLE: Leechburg

COAL SAMPLE NO(S).: 404224/793645/2A, 404224/793645/B, 404224/793645/C
JOINTING: Coal cleat: N57W, vert.; N60W, vert.; N63W, vert. (face, ½"-2" spacing); N40E, vert.; N38E, vert.; N14E, vert. (butt, ½"-2" spacing). Strike and dip on coal: N40E, 2SE; N50W, 2SW.
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
12.0+	Siltstone			Gn gy																						
1.0	Clay shale			Md lt gy																						
17.0±	Silty clay shale			Md gy																						Calcite-iron oxide vein filling (2" wide)--N15W, vert. Few siderite nodules (2" x 4").
12.2	Silt-clay laminite shale			Md dk gy																						Few plant stems. Carbonaceous clay layers.
4.6	Carbonaceous clay shale			Md dk gy																						Few plant stems. Few fructifications(?).
5.5	Clay shale			Md dk gy																						Thin silty laminae and bands (~¼" thick, tan, weathered) in upper part.
3.2	Coal	1.55	S	Bk	B			X			X	X	M	4.1	37.0	53.2	5.7	5.4	76.7	1.4	8.3	2.5	13700	8	2090	Few pyrite streaks (<1 mm thick). Very thin shaly coal parting 1.4' above base.
	Clay shale	0.05		Gy bk																						
	Coal	0.75		Bk	B			X			X	X	MD	2.4	36.3	51.0	10.3	5.1	73.5	1.4	7.9	1.8	13200	3	2360	
	Silty claystone	0.05		Gy bk																						
	Coal	0.5		Bk	B			X				X	MB	3.0	36.0	51.1	9.9	5.2	73.2	1.4	8.1	2.2	13120	8	2250	
	Bone	0.3		Gy bk	N				X			X	D													
	Claystone		S	Md dk gy																						Rootworked. Stigmaria abundant.

SITE/STATION NO. 36-3
COMPANY: Nicholson Run
MINE: Strip mine
PERMIT: 586-5
SAMPLING METHOD: Channel
REPORTED COAL NAMES:

COUNTY: Armstrong
LAT. °N: 40°44'54"
LONG. °W: 79°36'16"
GEOLOGIST: Skema
DATE: 6-76
ELEV. (base lower coal): 1062'
TWP.: South Buffalo
15' QUADRANGLE: Freeport
7 1/2' QUADRANGLE: Leechburg

COAL SAMPLE NO(S).: 404454/793616/2A, 404454/793616/2B, 404454/793616/2C
JOINTING: Coal cleat: N23E, vert. (face); N54W, vert. (butt). Strike and dip on coal: N51E, 3SE.
WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
32.1	Sandstone		S	Lt gy to vy lt gy																						Grain size fines upward. Top inaccessible.
0-2.9	Claystone		S	Gy bk to dk gy																						Good stem impressions common. Few leaf impressions.
0-12.5	Sand-clay laminite		S	Md dk gy Md lt gy																						Good stem and leaf impressions common.
0.9-2.5	Claystone		S	Gy bk																						Coarsens upward--silty at top.
2.9	Coal	1.2	S	Bk	B	X	X			X	X		B	1.8	36.3	54.0	7.9	5.3	74.5	1.4	6.3	4.6	13680	8	2165	Four-inch thick pyrite bands.
	Coal	1.0	S	Bk	B		X				X	X	M	2.5	34.5	52.1	10.9	5.3	73.0	1.4	7.6	1.8	13150	8	2420	
	Clay shale	0.1	S	Gy bk																						Thin vitrain laminae rare.
	Coal	0.6	G	Bk	B			X			X	X	MB	2.4	33.4	47.7	16.5	4.9	67.3	1.3	8.0	2.0	12160	8	2620	Shaly clay in bottom 0.05'.
0.1+	Clay shale			Md dk gy																						Rootworked.

SITE/STATION NO. 45-20	COUNTY: Armstrong		COAL SAMPLE NO(S).: 404643/792833/2A, 404643/792833/2B, 404643/792833/2C, 404643/792833/2D
COMPANY: L & E Construction & Equipment Co.	LAT. °N: 40°46'43"	ELEV. (base lower coal): 1065'	JOINTING: Coal cleat: N58W, vert.; N62W, 89SW; N59W, vert.: N31E, 88SE; N30E, 86SE; N36E, 86SE (½-2' spacing)
MINE: Strip mine	LONG. °W: 79°28'33"	TWP.: Kittanning	
PERMIT: 26-13	GEOLOGIST: Reardon	15' QUADRANGLE: Rural Valley	
SAMPLING METHOD: Channel	DATE: 7-2-75	7 1/2' QUADRANGLE: Mosgrove	Strike and dip on coal: N38E, 4SE; N19E, 2SE.
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)									
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
6+	Sandstone		U	Md lt gy																						Jointing: N61E, 89NW; N54E, 88NW; N69W, vert.; N49W, 89NE. Top inaccessible.
10.9	Sandy siltstone		G	Md gy																						
4.9	Silt-clay laminite		S	Md dk gy																						Plant fossils common.
4.0	Coal	1.1		Bk	B				X		X	X	MD	2.2	34.5	55.2	8.1	5.1	74.3	1.4	5.8	5.3	13480	8½	2300	Thin band (1" thick) of clay shale at base. Pyrite streaks common.
	Coal	1.3		Bk	B				X		X	X	D	1.6	34.8	52.1	11.5	5.0	72.3	1.5	7.7	2.0	13100	8	2410	Thin band (<1" thick) of shaly coal at base. Pyrite streaks.
	Coal	0.9		Bk	B			X	X		X	X	D	2.2	32.7	50.2	14.9	4.9	69.9	1.4	6.6	2.3	12480	7	2430	Thin band (<1" thick) of clay shale at base. Slickensides in shale.
	Coal	0.7	S	Bk	B				X		X	X	MD	2.0	35.2	48.8	14.0	5.0	70.2	1.3	7.4	2.1	12590	7½	2910+	Pyrite lenses rare.
	Silty claystone			Gy bk																						Plant fossils.

SITE/STATION NO. 45-21
COMPANY: B H & H Inc.
MINE: Strip mine
PERMIT: 617-7
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Lower Kittanning

COUNTY: Armstrong
LAT. °N: 40°49'49"
LONG. °W: 79°22'27"
GEOLOGIST: Reardon
DATE: 7-3-75

ELEV. (base lower coal): 1356'
TWP.: Valley
15' QUADRANGLE: Rural Valley
7 1/2' QUADRANGLE: Rural Valley

COAL SAMPLE NO(S).: 404949/792227/2A, 404949/792227/2B
JOINTING: Coal cleat: N70W, vert.; N64W, 88NE; N65W, vert.; N24E, 89NW; N21E, 89NW; N27E, 86NW (½"-2" spacing). Strike and dip on coal: N65E, 2SE; horiz.
WEATHERING: Fresh

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded (B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10+	Clay shale			Dk gy																						
8.2	Silt-sand laminite		S	Yl gy																						
10.2	Silty clay shale		U	Dk gy																						Plant fossils rare. Slickensided.
2.4	Coal	1.0	S	Bk	B				X			X	M	1.5	35.9	52.4	10.2	5.2	74.0	1.3	5.7	3.6	13390	8	2030	Pyrite streaks abundant. Thin band of pyritic clay shale at base (<½" thick).
	Coal	1.4		Bk					X		X	X	MB	1.9	33.2	53.3	11.6	5.1	73.2	1.3	6.6	2.2	13070	8	2520	Pyrite lenses common.
0.7	Claystone			Dk gy																						Plant fossils. Slickensides.

SITE/STATION NO. 45-22	COUNTY: Armstrong		COAL SAMPLE NO(S): 405436/792054/1
COMPANY: Terry Reddinger Coal Co.	LAT. °N: 40°54'36"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 79°20'54"	TWP.: Wayne	JOINTING: Coal cleat: N58W, vert. (face); N49E, vert. (butt). Jointing above coal: N52E, vert.; N36E, vert.; N57W, vert. (vertical extent of joints: 2'-10'). Attitude of coal bed: horizontal.
PERMIT: 314-32	GEOLOGIST: Skema	15' QUADRANGLE: Rural Valley	
SAMPLING METHOD: Channel	DATE: 6-22-76	7 1/2' QUADRANGLE: Distant	
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
20±	Clay shale																									Inaccessible. Very weathered. Large siderite nodules common.
42±	Claystone	8±																								Inaccessible. Appears to have olive color.
	Claystone	30±	G																							Inaccessible. Appears to have olive-gray color.
	Claystone	4±		Md gy																						Top inaccessible.
2.2	Carbonaceous clay shale		S	Dk gy																						
3.1	Bone coal		S	Bk																						
2.1	Claystone		G	Md gy																						Plant fossils few. Few very fine grained sand laminae.
2.35+	Coal	0.6	S	Bk	B				X			X	MB	1.9	35.2	57.3	5.6	5.4	77.5	1.5	7.1	2.9	14080	8½	2110	
	Coal	0.05	S	Bk	N																					Fusain.
	Coal	1.7+	S	Bk	B	X				X	X		MB													Bottom not uncovered.

SITE/STATION NO. 46-9
COMPANY: Bryar Const. Co.
MINE: Strip mine
PERMIT: 575-1
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Pittsburgh

COUNTY: Armstrong
LAT. °N: 40°33'32"
LONG. °W: 79°25'59"
GEOLOGIST: Reardon
DATE: 6-9-75

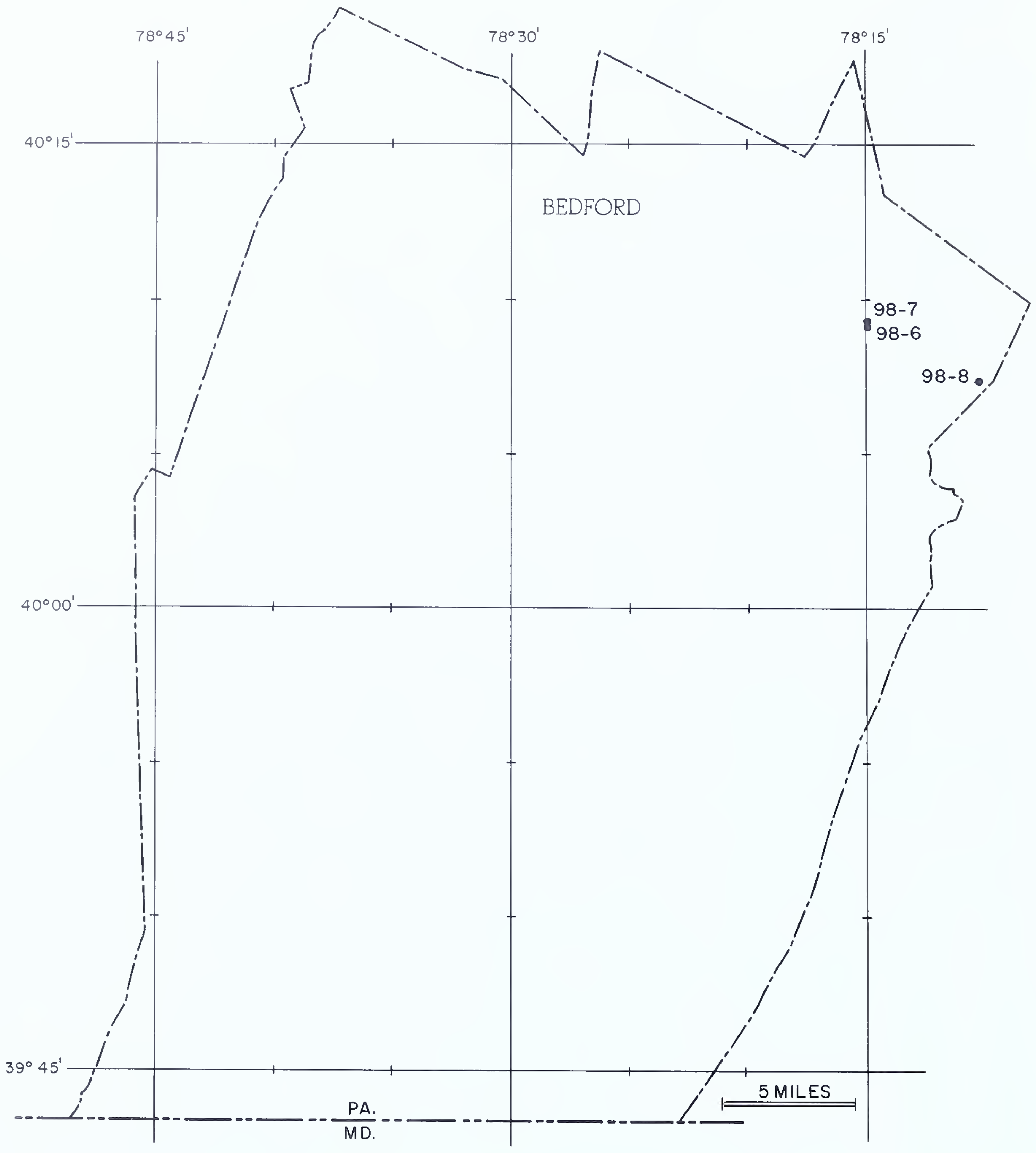
ELEV. (base lower coal): 960'
TWP.: Kiskiminetas
15' QUADRANGLE: Elders Ridge
7 1/2' QUADRANGLE: Avonmore

COAL SAMPLE NO(S).: 403332/792559/2A, 403332/792559/2B, 403332/792559/4, 403332/792559/5
JOINTING: Coal cleat: N56W, vert.; N66W, 85NE (>2" spacing); N15E, vert.; N8E, vert. (½"-2" spacing). Strike and dip on coal: N55W, 3NE.
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.0+	Sand-silt laminite			Md gy																						
3.0	Claystone		G	Md gy																						
6.4	Coal	1.4	S	Bk	B				X		X	X	M	1.6	29.5	36.5	32.4	4.0	52.1	1.0	3.1	7.4	9520	5	2150	Lenses of clay shale abundant. For trace element analysis, see sample #403332/792559/5.
	Claystone	0.8	S	Gy bk																						Slickensides.
	Coal	0.7	S	Bk	B				X			X	M	2.8	27.4	34.5	35.3	3.9	49.8	1.0	6.1	3.9	8910	4½	2510	Few pyrite lenses. For trace element analysis, see sample #403332/792559/4.
	Claystone	0.2	S	Dk gy																						Plant fossils.
	Coal	1.6	S	Bk	B			X			X	X	M	1.6	38.3	50.1	10.0	4.9	73.8	1.5	5.4	4.4	13410	7½	2070	Pyrite streaks at base (½"-1" thick). For trace element analysis, see sample #403332/792559/2B.
	Coal	1.7	S	Bk	B			X	X		X	X	MB	2.6	32.2	50.9	14.3	4.9	71.1	1.3	6.3	2.1	12550	7	2610	Pyrite abundant. For trace element analysis, see sample #403332/792559/2A.
	Coal																									2' of coal not yet exposed reported by foreman (underlain by claystone).

SITE/STATION NO. 46-10	COUNTY: Armstrong	COAL SAMPLE NO(S).: 403544/792349, [illegible], [illegible], [illegible], [illegible], [illegible], 4C, 6A, 6B
COMPANY: Rochester & Pittsburgh Coal Co.	LAT. °N: 40°35'44" — ELEV. (base lower coal): 1136'	
MINE: Strip mine	LONG. °W: 79°23'49" — TWP.: South Bend	
PERMIT: 482-8	GEOLOGIST: Reardon — 15' QUADRANGLE: Elders Ridge	JOINTING: Coal cleat: N66W, 88NE; N67W, 89NE; N69W, vert.; N22E, 75NW; E-W, 89N; N11E, 89°W (½-2" spacing).
SAMPLING METHOD: Channel	DATE: 7-17-75 — 7 1/2' QUADRANGLE: Avonmore	
REPORTED COAL NAMES: Pittsburgh		WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)									
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10+	Sandstone			Lt gy																						Jointing: N49W, vert., N59E, 89SE; N45W, 87NE; N13E, 39NW.
15+	Clay shale		U	Md dk gy																						Plant fossils at base.
11.3	Coal	1.1		Bk	B				X			X	MD	5.3	29.1	49.7	15.9	4.9	66.6	1.4	10.1	1.1	11880	7½	2910+	Pyrite rare.
	Clay shale	0.1		Dk gy																						
	Coal	0.8		Bk	B				X		X	X	MD	5.1	32.1	51.5	11.3	5.2	70.5	1.4	10.0	1.6	12630	8	2520	Pyrite nodules common.
	Claystone	0.9	S	Dk gy																						Slickensides. Plant fossils.
	Coal	1.5	S	Bk	B				X		X	X	MD	1.9	33.3	48.3	16.5	4.9	69.0	1.4	6.6	1.6	12550	7	2380	Pyrite rare.
	Carbonaceous clay shale	0.1		Gy bk																						
	Coal	0.9		Bk	B			X			X	X	MD	4.6	32.8	48.7	13.9	5.0	69.3	1.5	9.4	0.9	12320	8	2910+	Pyrite lenses common.
	Carbonaceous clay shale	0.2		Gy bk																						Plant fossils.
	Coal	1.8		Bk	B				X		X	X	MD	3.4	30.1	46.3	20.2	4.6	63.9	1.4	8.2	1.7	11450	7	2520	Streaks of pyrite common.
	Carbonaceous clay shale	0.5		Gy bk																						Plant fossils common.
	Coal	1.2		Bk	B			X			X	X	MB	3.6	31.5	52.5	12.4	4.9	71.7	1.5	8.6	0.9	12760	7½	2910+	Pyrite lenses rare at base, <1" thick.
	Coal	1.0		Bk	B		X	X			X	X	B	3.6	29.5	53.1	13.8	4.7	70.0	1.4	8.5	1.6	12470	7½	2680	Few streaks of pyrite.
	Coal	1.2		Bk	B			X	X		X	X	D	3.9	33.6	53.4	9.1	5.1	74.5	1.4	8.4	1.5	13210	8½	2380	Few bands of shale.
	Claystone			Md dk gy																						Plant fossils.


78°45'
78°30'
78°15'
40°15'
40°00'
39° 45'
BEDFORD
98-7
98-6
98-8
5 MILES
PA.
MD.

SITE/STATION NO. 98-6	COUNTY Bedford		COAL SAMPLE NO(S).: [illegible]
COMPANY: New Enterprise Stone & Lime Co.	LAT °N: 40°09'18"	ELEV. (base lower coal): 1350-1450'	
MINE: Judy Hollow strips	LONG. °W. 78°14'58"	TWP.: Broad Top	
PERMIT: 796-2	GEOLOGIST: Edmunds	15' QUADRANGLE: Broad Top	JOINTING: N85W, vert. (systematic, 0.1-0.5 spacing),
SAMPLING METHOD: Channel	DATE: 6-3-76	7 1/2' QUADRANGLE: Saxton	N4E, vert. (nonsystematic, 0.1-1.0 spacing).
REPORTED COAL NAMES: Barnett, Kelly			WEATHERING: Fresh to weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Weathered clay and coal(?) blossom																									
40±	Sandstone			Lt gy																						Fine-grained sand.
			S																							
39	Claystone			Md lt gy to lt ol gy																						Some silty zones.
			C																							
25±	Cover																									Reported to include a 2.5' coal about 4'-[illegible] above 5.2' coal below.
			C																							
2	Clay shale			Md lt gy																						
			S																							
5.2	Coal (Kelly)			Bk	B			X			X	X	M	1.4	18.9	68.2	11.5	4.4	76.5	1.5	3.9	2.0	13489	9	2775	Strong cross cleat (cleavage). Peacock stain. Slickensides.
			S																							
7	Claystone			Md lt gy																						*Stigmaria* and rootlets common.
			C																							
115±	Cover																									Thickness estimated from dip calculations.
			C																							
20	Sandstone			Lt gy																						Medium-grained sand.
			G																							
15±	Silty sandstone			Md gy																						Silt to fine-grained sand.
			C																							
20±	Cover																									
			C																							
2	Silty clay shale			Ol gy																						
			S																							
2.1	Coal (Barnett)			Bk	B			X				X	M	1.1	19.2	74.2	5.5	4.5	83.5	1.4	4.2	0.8	14533	9	2800+	Slickensides. Strong cross cleat (cleavage).
			S																							
2+	Silty clay shale			Md lt gy																						Plant fragments, leaves, branches abundant. Slickensides.

SITE/STATION NO. 98-7 (page 1)	COUNTY: Bedford		COAL SAMPLE NO(S).: 400927/781458/2A, 2B, 4, 8
COMPANY: New Enterprise Stone & Lime Co.	LAT °N: 40°09'27"	ELEV. (base lower coal): 1400'	
MINE: Judy Hollow strips	LONG. °W: 78°14'58"	TWP.: Broad Top	
PERMIT: 796-2	GEOLOGIST: Edmunds	15' QUADRANGLE: Broad Top	JOINTING:
SAMPLING METHOD: Channel	DATE: 6-3-76	7 1/2' QUADRANGLE: Saxton	
REPORTED COAL NAMES: Fulton			WEATHERING: Fresh

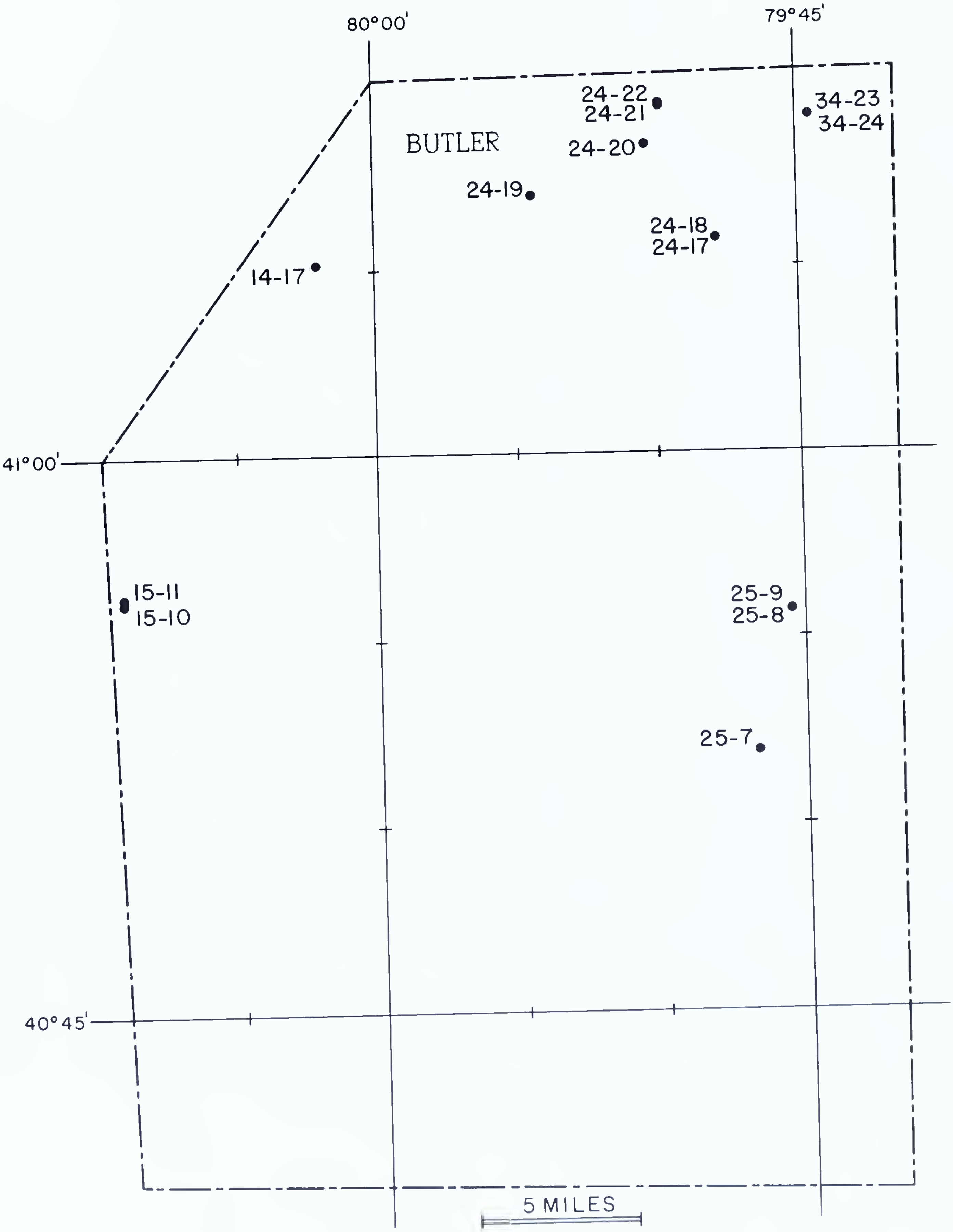
STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Coal blossom		S	Bk																						
4	Sandstone		S	Lt gy																						Plant fragments and branches common. Silt to fine-grained sand.
0.8	Coal		S	Bk																						Badly weathered.
5	Clay shale to claystone		S	Md lt gy to dk gy																						
9	Silt shale to sand-silt laminite shale		S	Lt gy and md lt gy																						Silt to fine-grained sand. Sandier upward.
0? to 1.7	Coal		S	Bk	B				X			X	MB	2.3	15.2	52.6	29.9	3.6	53.3	0.9	4.7	2.5	10208	7	2610	High fusain content. May be lensoidal.
4	Clay-silt laminite shale		S	Dk gy and lt ol gy																						
9	Siltstone, silty sandstone, and sand-silt laminite		S	Md gy and md lt gy																						Plant fragments common. Rootlets in top 1 ft.
5	Clay shale		S	Dk gy																						Plant fragments, leaves, twigs abundant.
0 to 2.9	Coal		S	Bk to gy bk	N								D	2.3	14.1	42.2	41.4	3.1	45.9	0.7	4.7	4.2	8137	1	2515	Lensoidal or squeezed out by folding. Grades laterally to carbonaceous claystone.
27	Sandstone to sandy siltstone			Lt gy																						Upper several feet is rootworked seat earth. Plant fragments, leaves, branches, few to common. Carbonaceous lenses.

SITE/STATION NO. 98-7 (page 2)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT °N: ELEV. (base lower coal):	
MINE:	LONG. °W. TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
8.7	Coal	4.2	S	Bk	B			X				X	MB	2.9	15.0	54.2	27.9	3.7	59.9	1.0	6.7	0.8	10230	1	2800+	Slickensides. Strong cross cleat (cleavage). High fusain. Breaks to splinters or wafer-like fragments.
	Coal	4.5	S	Bk	B				X		X	X	M	1.2	15.3	55.7	27.8	3.7	61.7	1.1	5.0	0.6	10616	1	2800+	Strong cross cleat (cleavage). Harder than upper bench.
	Silt shale (top only)		S	Gy bk																						Plant trunks and branches abundant.

SITE/STATION NO. 98-8	COUNTY: Bedford		COAL SAMPLE NO(S).: 400734/781008/4, 400734/781008/8
COMPANY: Kenneth G. Richards	LAT °N: 40°07'34"	ELEV. (base lower coal): ~2300'	
MINE: Stripping	LONG. °W: 78°10'08"	TWP.: Broad Top	
PERMIT: 453-74	GEOLOGIST: Edmunds	15' QUADRANGLE: Broad Top	JOINTING: N54W, vert.; N46E, vert.
SAMPLING METHOD: Channel	DATE: 6-2-76	7 1/2' QUADRANGLE: Saxton	
REPORTED COAL NAMES: Barnett, Twin, Kelly			WEATHERING: Fresh to weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
7+	Clay shale		S	Gy bk																						Frequent olive-gray laminae.
2.4	Coal (Kelly)		G	Bk	B				X			X	M-MD	15.5	18.7	52.4	13.4	4.3	57.7	0.9	23.1	0.6	9439	0	2585	Slightly weathered.
17	Silty claystone		S	Md gy																						Plant fragments common. Limonitic.
17	Silty sandstone		S	Md gy																						Few plant fragments.
4.5	Silty claystone to silty clay shale		S	Md dk gy																						Plant fragments and leaves common.
2.7	Coal (Twin)		S	Bk	B		X					X	M	2.9	15.3	71.8	10.0	4.2	76.8	1.2	5.4	2.5	13447	9	2625	High fusain content.
0.7	Clay shale		G	Gy bk																						
2	Silty claystone		G	Md lt gy																						Plant fragments and leaves abundant.
13	Interbedded silt shale (70%) and sandstone (30%)		S	Md gy and md lt gy																						Silt to fine-grained sand. Plant fragments common.
	Coal (top only exposed) (Barnett)			Bk																						


80°00'
79°45'
24-22
24-21
34-23
34-24
BUTLER
24-20
24-19
24-18
24-17
14-17
41°00'
15-11
15-10
25-9
25-8
25-7
40°45'
5 MILES

SITE/STATION NO. 14-17	COUNTY: Butler		COAL SAMPLE NO(S).: 410516/800210/2A, 410516/800210/2B, 410516/800210/2C
COMPANY: Sunbeam Coal Co.	LAT °N: 41°05'16"	ELEV. (base lower coal): 1322'	
MINE: Strip mine	LONG. °W: 80°02'10"	TWP.: Slippery Rock	JOINTING: Coal cleat: N56W, 81NE; N58W, vert.; N57W, vert. (>2" spacing); N36E, 79NW; N41E, 88NW; N33E, 87NW (½"-2" spacing). Strike and dip on coal: N52E, 4SE.
PERMIT: 179-20	GEOLOGIST: Reardon	15' QUADRANGLE: Mercer	
SAMPLING METHOD: Channel	DATE: 6-23-75	7 1/2' QUADRANGLE: Slippery Rock	
REPORTED COAL NAMES: Lower Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
16.0+	Clay shale			Md dk gy																						Jointing: N33E, vert.; N56W, 86NE. Siderite nodules at top of bed (2" x 4"). Plant fossils.
4.0	Shaly coal	0.9	G	Bk	B				X			X	D													
	Coal	1.3		Bk	B			X			X	X	MB	2.7	36.3	52.6	8.4	5.3	75.1	1.4	9.0	0.8	13280	2½	2910+	Few lenses of pyrite.
	Clay shale	0.1		Gy bk																						
	Coal	0.4		Bk	B		X	X			X	X	B	3.2	35.7	54.4	6.7	5.5	75.7	1.6	9.7	0.8	13340	4½	2910+	Prominent band of vitrain at base of coal. Few lenses of pyrite.
	Coal	1.3		Bk	B	X	X			X	X	X	MB	3.8	34.0	59.5	2.7	5.4	79.0	1.6	10.7	0.6	13930	4½	2910+	Band of shale 0.4' from base (<¼" thick).
	Claystone		S	Dk gy																						Plant fossils.

SITE/STATION NO. 15-10	COUNTY: Butler	COAL SAMPLE NO(S).: 40560[illegible]/[illegible]0910, [illegible]
COMPANY: Kerry Coal, Inc.	LAT °N 40°56'02"	ELEV. (base lower coal): 1262'
MINE: Strip mine	LONG. °W: 80°09'10"	TWP.: Muddy Creek
PERMIT: 41-34	GEOLOGIST: Gabler	15' QUADRANGLE: Zelienople
SAMPLING METHOD: Channel	DATE: 7-16-75	7 1/2' QUADRANGLE: Portersville
REPORTED COAL NAMES: Middle Kittanning		

JOINTING: Coal cleat: N70W, [illegible]

WEATHERING: Fresh to weathered

STRATIGRAPHIC DATA													COAL ANALYSIS													
					COAL								PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
~30	Clay shale			Md gy																						
0.5	Carbonaceous clay shale			Dk gy to gy bk																						
0.3	Coal		G	Bk	B				X			X	B	1.8	39.0	49.5	9.7	5.4	73.9	1.8	8.3	0.9	13210	4	2820	
0.5	Carbonaceous clay shale		G	Dk gy to gy bk																						
7	Clay shale		G	Md dk gy to dk gy																						
~2	Carbonaceous clay shale		G	Dk gy to gy bk																						
0.8	Coal		S	Bk	B				X		X	X	M	1.6	36.1	46.5	15.8	5.1	68.1	1.6	7.3	2.1	12270	4	2530	
~15	Silty clay shale		G	Dk gy																						
~2	Carbonaceous clay shale		G	Dk gy to gy bk																						
	Backfill		G																							
	Middle Kittanning coal (covered)																									

SITE/STATION NO. 15-11	COUNTY: Butler			COAL SAMPLE NO(S).: 405610/800910/2, 405610/800910/4, 405610/800910/6	
COMPANY: Kerry Coal, Inc.	LAT °N: 40°56'10"	ELEV. (base lower coal): 1228'			
MINE: Strip mine	LONG. °W: 80°09'10"	TWP.: Muddy Creek			
PERMIT: 41-34	GEOLOGIST: Gabler	15' QUADRANGLE: Zelienople		JOINTING: Coal cleat: N75W, 84S; N20E, 37NW. Strike and dip on claystone above coal: N5W, 3NE.	
SAMPLING METHOD: Channel	DATE: 7-16-75	7 1/2' QUADRANGLE: Portersville			
REPORTED COAL NAMES: Middle Kittanning				WEATHERING: Fresh	

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
~25	Clay shale			Gy bk																						
~1	Coal			Bk																						See 405602/800911/9[1] for analyses and description.
~3	Clay shale		S	Gy bk																						
~10	Sandstone		G	Md bn																						
1	Carbonaceous clay shale		G	Bk																						
0.5	Coal		S	Bk																						See 405602/800911/5[1] for analysis and description.
~15	Silty clay shale		S	Md dk gy to dk gy																						Siderite nodules common (5").
1.5	Carbonaceous claystone		G	Bk																						Plant fossils common.
3.15	Coal	1.1	S	Bk	B			X		X	X	X	M	1.7	40.0	49.2	9.1	5.2	73.7	1.5	7.7	2.8	13370	4	2130	
	Claystone	0.1		Gy bk to bk																						
	Coal	1.6	S	Bk	B			X		X	X	X	MB	3.5	37.9	52.1	6.5	5.5	75.0	1.0	9.6	2.4	13400	6½	2190	
	Clay shale	0.05	S	Gy bk to bk																						
	Coal	0.3	S	Bk	B			X		X	X	X	MB	4.8	33.7	52.9	8.6	5.2	71.2	1.3	9.4	4.3	12690	5	2190	
0.1	Claystone		S	Md lt gy to md gy																						Rootworked.

[1] Site no. 15-10.

SITE/STATION NO. 24-17	COUNTY: Butler		COAL SAMPLE NO(S).: 410542/794743/2A, 410542/794743/2B, 410542/794743/2C
COMPANY: Nastasi Coal Co.	LAT °N: 41°05'42"	ELEV. (base lower coal): 1519'	
MINE: Strip mine	LONG. °W: 79°47'43"	TWP.: Washington	
PERMIT: 645-2	GEOLOGIST: Reardon	15' QUADRANGLE: Hilliards	JOINTING: Coal cleat: N39W, vert.; N46W, vert. (½-2' spacing); N52E, 83NW; N46E, vert. (½'-2' spacing). Strike and dip on coal: N36E, 6SE.
SAMPLING METHOD: Channel	DATE: 6-20-75	7 1/2' QUADRANGLE: Hilliards	
REPORTED COAL NAMES: Middle Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS											
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)								
						ABUNDANCE				THICKNESS															
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
6.0+	Sandstone		U	Lt gy																						Crossbedded.
7.6	Clay shale			Md dk gy																						Pyritic clay shale laminae at base (½"-1").
3.4	Coal	1.3		Bk	B				X		X	X	M	2.0	39.9	48.6	9.5	5.3	72.4	1.5	7.4	3.9	13150	6½	2040	Abundant pyrite streaks. Bone at top.
	Coal	0.9		Bk	B		X	X			X		M	1.8	37.4	51.9	8.9	5.3	73.3	1.6	8.4	2.5	13170	6½	2130	Abundant pyrite streaks. Thin band of pyrite at base.
	Coal	1.2	S	Bk	B	X	X				X	X	MB	3.3	37.6	53.3	5.8	5.4	74.7	1.5	9.8	2.8	13290	6½	2250	
	Claystone																									

SITE/STATION NO. 24-18	COUNTY: Butler		COAL SAMPLE NO(S).: 410542/794746/2C, 410542/794746/2B	
COMPANY: Nastasi	LAT. °N: 41°05'42"	ELEV. (base lower coal): 1518'		
MINE: Strip mine	LONG. °W: 79°47'46"	TWP.: Washington		
PERMIT: 645-2	GEOLOGIST: Reardon	15' QUADRANGLE: Hilliards	JOINTING: Coal cleat: N38W, 86SW; N32W, 86SW (½"-2" spacing); N43E, vert.; N36E, 86NW (½"-2" spacing). Strike and dip: N35E, 2SE; N30E, 4SE.	
SAMPLING METHOD: Channel	DATE: 6-20-75	7 1/2' QUADRANGLE: Hilliards		
REPORTED COAL NAMES: Middle Kittanning			WEATHERING: Fresh	

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
6.0	Sandstone		U	Lt gy																						Crossbedded.
7.6	Clay shale		S	Md dk gy																						Few plant fossils.
3.4	Coal	1.1		Bk	B		X	X			X	X	M	2.1	39.2	49.4	9.3	5.4	72.9	1.5	7.6	3.3	13210	5	2080	Bed of claystone (seat earth) at base (½" thick). For trace element analysis, see sample #410542/794746/2C.
	Coal	0.7		Bk	B		X	X			X	X	MB	2.6	40.4	47.2	9.8	5.5	72.3	1.5	8.1	2.8	13010	7½	2180	Pyrite streaks at base (<½" thick). For trace element analysis, see sample #410542/794746/2B.
	Coal	1.6	S	Bk	B	X	X			X	X	X	MB													Abundant streaks and lenses of pyrite.
	Claystone			Gy bk																						Plant fossils.

SITE/STATION NO. 24-19	COUNTY: Butler		COAL SAMPLE NO(S): 410659/795429 2A, 410659 795429 [illegible], 410659/795429 2C, 410659 795429 [illegible]
COMPANY: Sunbeam Coal Co.	LAT °N: 41°06'59"	ELEV. (base lower coal): 1233'	
MINE: Strip mine	LONG. °W: 79°54'29"	TWP.: Marion	
PERMIT: 179-23	GEOLOGIST: Reardon	15' QUADRANGLE: Hilliards	JOINTING: Coal cleat: N57W, [illegible]SW; N54W, [illegible]SW; N56E, [illegible];
SAMPLING METHOD: Channel	DATE: 7-11-75	7 1/2' QUADRANGLE: W. Sunbury	N33E, 86SE ([illegible]"-2" spacing). Strike and dip of coal: [illegible],
REPORTED COAL NAMES: Clarion			WEATHERING: Fresh [illegible]

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5.0+	Claystone			Md dk gy																						Few siderite nodules. Jointing: N29W, [illegible]NE; N26W, 81SW; N12E, 77SE; N36E, 75SE.
0.6	Coal		S	Bk	B				X		X	X	D	2.4	41.0	48.5	8.1	5.3	72.6	1.3	7.9	4.8	13270	4½	2130	
16.9	Claystone		S	Md dk gy																						Plant fossils.
1.7	Coal	0.5	S	Bk	B			X	X		X	X	D	3.2	35.0	51.1	10.7	5.0	71.9	1.4	9.7	1.3	12850	5½	2640	Few pyrite lenses.
	Carbonaceous clay shale	0.1		Bk																						
	Coal	0.4		Bk	B				X		X		D	3.1	36.9	51.1	8.9	5.3	73.4	1.6	9.8	1.0	13030	5	2910+	Small band of shale (<1" thick) at base; abundant pyrite streaks at top.
	Coal	0.7		Bk	B				X		X	X	D	4.4	36.3	54.5	4.8	5.4	76.1	1.5	10.8	1.4	13530	6	2410	
	Claystone		S	Gy bk																						Plant fossils.

SITE/STATION NO. 24-20	COUNTY: Butler		COAL SAMPLE NO(S).: 410820/795019/2A, 410820/795019/2B, 410820/795019/2C
COMPANY: Western Hickory Coal Co.	LAT °N: 41°08'20"	ELEV. (base lower coal): 1450'	
MINE: Strip mine	LONG. °W: 79°50'19"	TWP.: Venango	
PERMIT: 152-11	GEOLOGIST: Reardon	15' QUADRANGLE: Hilliards	JOINTING: Coal cleat: N51W, 82NE; N59W, 89NE; N60W, 86NE; N34E, 88SE; N36E, 83SE; N33E, vert. (½"-2" spacing).
SAMPLING METHOD: Channel	DATE: 7-10-75	7 1/2' QUADRANGLE: Eau Claire	
REPORTED COAL NAMES: Brookville			WEATHERING: Fresh / Strike and dip on coal: N54W, 5SW.

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
20+	Silt-sand laminite	20+		Md gy																						Jointing: N26E, 81SE; N13E, 86SE; N31W, 88NE; N39W, 81NE. Few plant fossils.
1.6	Silty clay shale		U	Md dk gy																						
2.2	Coal	0.7	S	Bk	B			X	X		X	X	D	2.5	29.4	44.4	23.7	4.4	60.8	1.1	6.5	3.5	10750	4	2180	Bands of shale abundant. Few pyrite lenses.
	Carbonaceous clay shale	0.1		Bn bk																						Slickensides. Plant fossils.
	Coal	0.6		Bk	B			X			X	X	D	3.1	35.6	53.4	7.9	5.3	74.0	1.5	8.8	2.5	13210	6	2180	Band of shale at base (<1" thick). Lenses of pyrite common.
	Coal	0.8		Bk	B		X	X			X	X	MD	3.2	35.7	54.4	6.7	5.3	75.3	1.6	8.8	2.3	13340	5½	2410	
0.1	Claystone		S	Dk gy																						Plant fossils.

SITE/STATION NO. 24-21	COUNTY: Butler		COAL SAMPLE NO(S).: 410921/794948/2A, 410921/794948/2B
COMPANY: B & D Coal Co.	LAT °N: 41°09'21"	ELEV. (base lower coal): 1468'	
MINE: Strip mine	LONG. °W: 79°49'48"	TWP.: Venango	
PERMIT: 558-4	GEOLOGIST: Reardon	15' QUADRANGLE: Hilliards	JOINTING: In silt-sand laminite: N27W, 89SW; N64E, 86NW.
SAMPLING METHOD: Channel	DATE: 6-10-75	7 1/2' QUADRANGLE: Eau Claire	Strike and dip on coal: N35E, 1NW; N21E, 1NW.
REPORTED COAL NAMES: Lower Kittanning			WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
18	Silt-sand laminite		U	Md dk gy																						Plant fossils abundant.
2.2	Coal	0.9		Bk	B				X		X	X	D	2.5	43.6	48.0	5.9	5.8	75.8	1.4	8.7	2.4	13690	5½	2140	Pyrite streaks and lenses rare.
	Claystone	0.2		Bn gy																						Slickensides. Plant fossils.
	Coal	1.1	S	Bk	B			X			X	X	D	3.3	36.9	52.5	7.3	5.4	74.1	1.5	8.9	2.8	13240	5½	2070	Few streaks of pyrite.
0.2	Claystone			Md dk gy																						Plant fossils.

SITE/STATION NO. 24-22
COUNTY: Butler
COAL SAMPLE NO(S).: 410924/794948/2A, 410924/794948/2B
COMPANY: B & D Coal Co.
LAT. °N: 41°09'24"
ELEV. (base lower coal): 1468'
MINE: Strip mine
LONG. °W: 79°49'48"
TWP.: Venango
PERMIT: 558-4
GEOLOGIST: Reardon
15' QUADRANGLE: Hilliards
JOINTING: Coal cleat: N61W, 89SW; N64W, 89SW; N66W, vert.; N24E, 85NW; N32E, 86NW. Strike and dip on coal: N15E, 2NW; N26E, 3NW; N79E, 1NW.
SAMPLING METHOD: Channel
DATE: 7-10-75
7 1/2' QUADRANGLE: Eau Claire
REPORTED COAL NAMES: Lower Kittanning
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
18+	Silt-sand laminite		U	Md lt gy																						Plant fossils. Jointing N56E, vert.; N28W, 84SW.
2.1	Coal	0.9		Bk	B				X		X	X	D	5.9	37.9	45.6	10.6	5.3	68.9	1.3	12.7	1.2	12310	4	2150	
	Claystone	0.1		Bn gy																						Plant fossils.
	Coal	1.1	S	Bk	B			X	X		X	X	MD	3.8	39.6	50.1	6.5	5.4	74.8	1.5	9.3	2.5	13270	7	2140	Pyrite streaks abundant.
0.1+	Claystone			Md dk gy																						Plant fossils.

SITE/STATION NO. 25-7	COUNTY Butler		COAL SAMPLE NO(S).: 405158/794644/2A, 405[illegible]
COMPANY: S. B. P. Coal Co.	LAT °N: 40°51'58"	ELEV. (base lower coal): 1146'	
MINE: Strip mine	LONG. °W: 79°46'44"	TWP.: Clearfield	
PERMIT: 147-6	GEOLOGIST: Reardon	15' QUADRANGLE: Butler	JOINTING: Coal cleat: N55W, vert.; N63W, vert. [illegible] spacing); N19E, 82NW; N24E, 85NW. Strike and dip [illegible] N3[illegible]E, 5[illegible].
SAMPLING METHOD: Channel	DATE: 6-11-75	7 1/2' QUADRANGLE: Saxonburg	
REPORTED COAL NAMES: Lower Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
20.0	Clay-silt shale		U																							
0.2	Limestone		U																							
18.0	Silt-clay laminite		G	Md dk gy																						
2.6	Claystone		S	Dk gy																						Plant fossils.
2.7	Coal	1.5		Bk	B		X				X	X		3.3	35.0	52.6	9.1	5.2	72.8	1.4	9.5	2.0	12910	7½	2190	Pyritic shale at base.[1]
	Coal	1.2	S	Bk	B		X	X			X	X		3.5	33.6	53.0	9.9	5.1	72.8	1.4	9.4	1.4	12860	5½	2480	Abundant pyrite lenses.[2]
	Claystone			Md dk gy																						Plant fossils.

[1] For trace element analysis, see sample #405158/794644/2B.

[2] For trace element analysis, see sample #405158/794644/2A.

SITE/STATION NO. 25-8	COUNTY: Butler		COAL SAMPLE NO(S).: 405535/794525/2A, 405535/794525/2B, 405535/794525/4A, 405535/794525/4B		
COMPANY: West Freedom Mining Co.	LAT. °N: 40°55'35"	ELEV. (base lower coal): ~1240'			
MINE: Strip mine	LONG. °W: 79°45'25"	TWP.: Donegal			
PERMIT: 68-31	GEOLOGIST: Reardon	15' QUADRANGLE: Butler	JOINTING: Coal cleat: N64W, 88SW; N69W, 86SW (½"-2" spacing); N19E, vert.; N29E, vert.		
SAMPLING METHOD: Channel	DATE: 6-12-75	7 1/2' QUADRANGLE: East Butler			
REPORTED COAL NAMES: Lower Freeport			WEATHERING: Fresh		

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3+	Clay-silt laminite			Dk gy																						
2.1	Carbonaceous clay shale		S	Bk																						
4.6	Coal	1.6	S	Bk	B				X			X	D	2.6	34.5	56.0	6.9	5.1	76.6	0.2	10.2	1.0	13480	5	2520	Thin band of pyrite at base. For trace element analysis, see sample #405535/794525/4B.
	Coal	0.9		Bk	B			X	X		X	X	D	1.7	34.9	57.1	6.3	5.3	76.9	1.0	9.0	1.5	13700	5½	2260	For trace element analysis, see sample #405535/794525/4A.
	Claystone	0.4	S	Md dk gy																						Plant fossils.
	Coal	0.5	S	Bk	B			X				X	D	1.8	30.0	48.1	20.1	4.5	63.9	1.2	9.4	0.9	11300	2½	2910+	Shale at base (0.1' thick). For trace element analysis, see sample #405535/794525/2B.
	Coal	1.2		Bk	B			X				X	D	1.5	30.0	52.4	16.1	4.7	67.2	1.2	9.4	1.4	11930	3½	2730	For trace element analysis, see sample #405535/794525/2A.
	Claystone		S	Md dk gy																						Plant fossils.

SITE/STATION NO. 25-9	COUNTY: Butler		COAL SAMPLE NO(S).: 405538/794529/2A, [illegible],
COMPANY: West Freedom Mining Co.	LAT °N: 40°55'38"	ELEV. (base lower coal): ~1240'	405538/794529/2C, 405538/794529/4A, 40553[illegible]
MINE: Strip mine	LONG. °W: 79°45'29"	TWP.: Donegal	
PERMIT: 68-31	GEOLOGIST: Reardon	15' QUADRANGLE: Butler	JOINTING: Coal cleat: N22E, 88W; N29E, 89SE [illegible] spac[illegible].
SAMPLING METHOD: Channel	DATE: 6-12-75	7 1/2' QUADRANGLE: East Butler	N63W, 87SW; N65W, 85SW (½"-2" spacing). Strike and dip [illegible]
REPORTED COAL NAMES: Lower Freeport			WEATHERING: Fresh coal: N63W, [illegible]

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3+	Clay-silt laminite			Md dk gy																						
6.0	Coal	1.4	S	Bk	B			X			X	X	D	2.9	27.2	42.5	27.4	4.0	57.0	1.1	9.3	1.2	10010	1½	2910+	For trace element analysis, see sample #405538/754529/4B.
	Clay-silt shale	0.1		Gy bk																						Plant fossils.
	Coal	2.1		Bk	B			X			X	X	D	2.4	33.6	57.4	6.6	5.1	74.9	1.4	10.1	1.9	13370	6	2190	Abundant pyrite lenses. For trace element analysis, see sample #405538/794529/4A.
	Claystone	0.5	S	Md dk gy																						Plant fossils.
	Coal	0.5	S	Bk	B			X			X	X	D	3.2	28.7	49.5	18.6	4.6	64.5	1.3	10.1	0.9	11340	3	2910+	For trace element analysis, see sample #405538/794529/2C.
	Carbonaceous clay shale	0.2		Gy bk																						Plant fossils.
	Coal	0.7		Bk	B		X			X	X	X	B	3.2	30.2	51.2	15.4	4.7	67.3	1.3	9.8	1.5	11850	4½	2680	Shale at base (<0.1' thick).
	Coal	0.5		Bk	B		X	X			X	X	MB	2.7	33.3	53.9	10.1	5.0	72.1	1.4	10.2	1.2	12870	6	2580	Few pyrite lenses. For trace element analysis, see sample #405538/794529/2B.
	Claystone		S	Md dk gy																						Plant fossils. For trace element analysis, see sample #405538/794529/2A.

SITE/STATION NO. 34-23 (page 1)
COMPANY: Lucas Coal Co.
MINE: Strip mine
PERMIT: 174-11
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Clarion

COUNTY Butler
LAT °N: 41°09'06"
LONG. °W: 79°44'09"
GEOLOGIST Reardon & Inners
DATE: 6-4-75
ELEV. (base lower coal): 1265'
TWP.: Allegheny
15' QUADRANGLE: Foxburg
7 1/2' QUADRANGLE: Emlenton

COAL SAMPLE NO(S).: 410906/794409/2A, 410906/794409/2B, 410906/794409/2C, 410906/794409/2D
JOINTING: Coal cleat: N65W, 88SW; N65W, 88SW (face); N28E, 88NW; N30E, 87NW (butt). Jointing above coal: N35E, 84NE; N65W, 85SW.
WEATHERING: Fresh

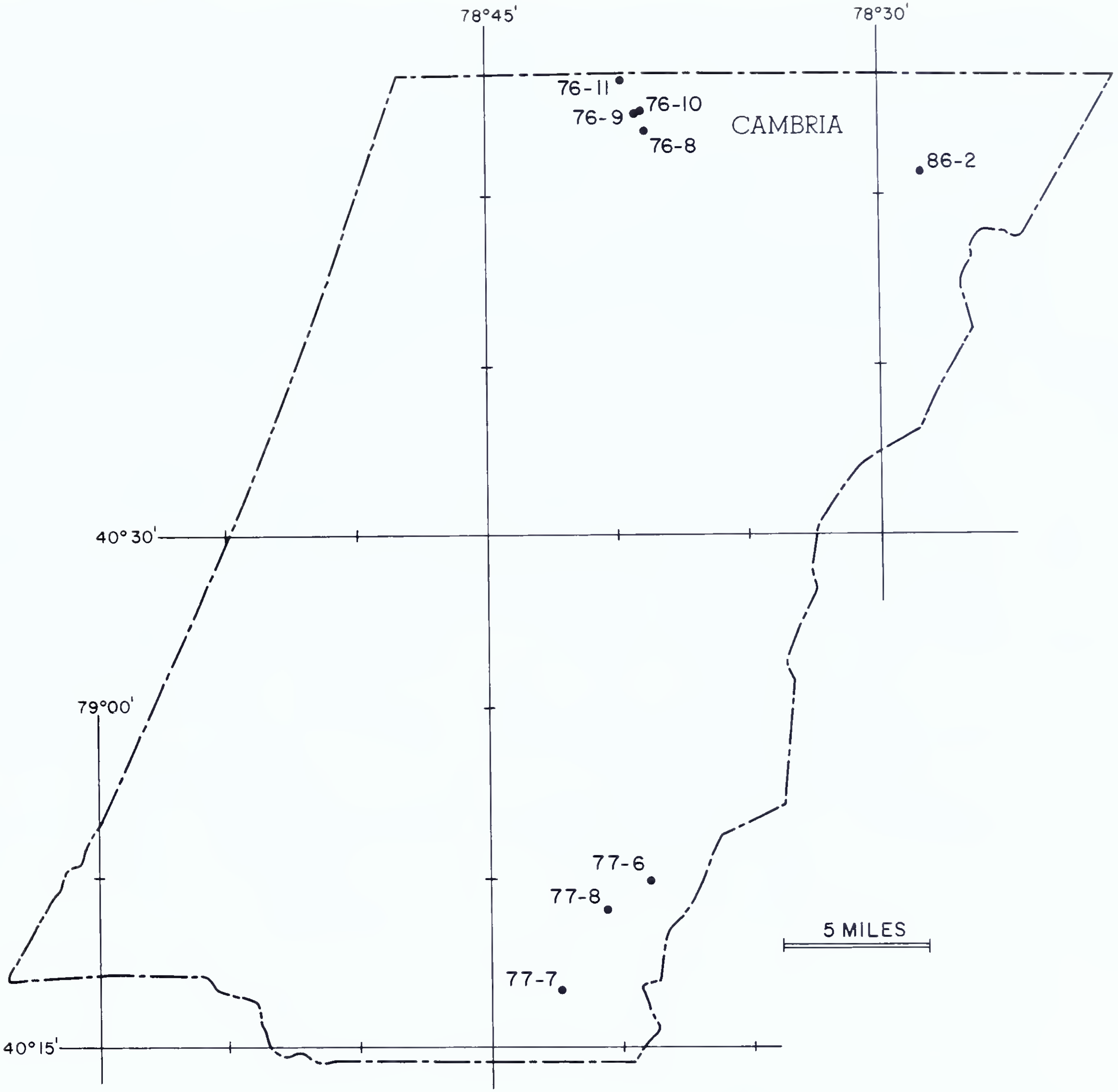
STRATIGRAPHIC DATA					COAL									COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
50+	Sandy siltstone																									Sandstone lenses (0.2'-0.6' thick).
	Silty clay shale		G	Md dk gy																						Siderite common in wormy nodule layers.
1.5	Coal		S	Bk																						
5.5	Silty claystone		S	Md dk gy																						Rootworking at top. Rare silt laminae in lower part.
7.0	Silt-clay laminite		G	Md dk gy Lt gy																						
11.0	Clay shale		G	Md dk gy																						Abundant plant stems. Silty at top.
5.3	Coal	1.1	S	Bk	B			X	X		X	X	M	1.7	35.7	50.0	12.6	4.9	67.0	1.2	10.0	4.3	12440	7½	2080	Silty clay shale included in analysis. For trace element analysis, see sample #410906/794409/2D.
	Silty clay shale	0.1		Ol gy																						Abundant plant stems. Abundant pyrite streaks and nodules.
	Coal	1.2		Bk	B			X			X	X	B	1.6	40.2	50.0	8.2	5.2	71.2	1.2	8.3	5.9	13030	7½	2400	Abundant pyrite streaks and nodules. Bone included in analysis. For trace element analysis, see sample #410906/794409/2C.
	Bone	0.1		Gy bk	B				X			X	D													Thin streaks of pyrite abundant, also disseminated throughout.

SITE/STATION NO. 34-23 (page 2)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT °N: / ELEV. (base lower coal):	
MINE:	LONG. °W: / TWP.:	
PERMIT:	GEOLOGIST: / 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: / 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Coal	1.7		Bk	B			X				X	MD	1.9	39.4	51.8	6.9	5.4	75.0	1.5	7.5	3.7	13630	8	2080	Pyrite abundant in nodular bony layers 0.6' and 1.1' above base. For trace element analysis, see sample #410906/794409 1B.
	Silty clay shale	0.1		Bk gy										1.1	33.8	39.0	26.1	4.4	55.9	1.0	5.3	7.3	10320	4½	2300	Streaks of pyrite abundant.
	Coal	1.0		Bk	B			X				X	MD													Pyrite parting (0.05' thick) 0.5' above base. Few pyrite blebs and streaks. Silty clay shale included in analysis. For trace element analysis, see sample #410906/794409 2A.
	Claystone		S	Md dk gy																						

SITE/STATION NO.	34-24	COUNTY	Butler	COAL SAMPLE NO(S).:	410906/794410/2D
COMPANY:	Lucas Coal Co.	LAT °N: $41^{0}09'06"$	ELEV. (base lower coal): ~1265'		
MINE:	Strip mine	LONG. °W: $79^{0}44'10"$	TWP.: Allegheny		
PERMIT:	174-11	GEOLOGIST: Reardon & Inners	15' QUADRANGLE: Foxburg	JOINTING:	Coal cleat: N72W, 88SW; N68W, vert. (face); N20E, 80NW; N30E, 80NW (butt).
SAMPLING METHOD:	Channel	DATE: 6-4-75	7 1/2' QUADRANGLE: Emlenton		
REPORTED COAL NAMES:	Clarion			WEATHERING:	Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5.8	Coal	1.3		Bk	B			X	X		X	X	MD	1.9	37.6	55.2	5.3	5.5	77.4	1.4	8.0	2.4	13980	7	2140	Some pyrite. For trace element analysis, see sample #410906/794410/2D.
	Silty clay shale	0.1		Dk ol gy																						Plant fragments (stems) abundant. Pyrite abundant.
	Coal	1.2		Bk	B				X		X	X	MD													Thin streaks of pyrite abundant.
	Bone	0.2		Gy bk	B				X			X	D													Pyritic.
	Coal	1.6		Bk	B			X			X	X	MD													Pyrite abundant, especially in nodules 0.8' above base.
	Silty clay shale	0.1		Dk ol gy																						Pyrite abundant.
	Coal	1.3		Bk	B			X			X	X	MD													
	Claystone			Md dk gy																						


78°45'
78°30'
76-11
76-10
76-9
76-8
CAMBRIA
86-2
40°30'
79°00'
77-6
77-8
77-7
5 MILES
40°15'

SITE/STATION NO. 76-8	COUNTY: Cambria		COAL SAMPLE NO(S).: 404150/783857/2, 404150/783857/8
COMPANY: Kristianson & Johnson	LAT °N: 40°41'50"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 78°38'57"	TWP.: Chest	
PERMIT: 56-75	GEOLOGIST: Glover	15' QUADRANGLE: Patton	JOINTING:
SAMPLING METHOD: Channel	DATE: 6-9-76	7 1/2' QUADRANGLE: Hastings	
REPORTED COAL NAMES: Lower Kittanning and Lower Kittanning rider			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Soil																									
			G																							
8.0	Clay shale			Lt ol gy to md dk gy																						Few thin coaly streaks at base. Light olive gray at top.
			S																							
0.6	Coal			Bk	B			X				X	MB	6.0	24.6	65.3	4.1	5.1	77.9	1.3	11.0	0.6	13697	4	2710	
			S																							
3.0-12.0	Silt shale			Lt ol gy																						Rootworked at top with *Stigmaria* abundant. Fine plant hash.
			G																							
4.0	Sandstone																									
			S																							
20.0	Clay shale																									
			S																							
6.0	Sandstone			Md gy to md lt gy																						
			S																							
3.5	Silt shale			Bk to gy bk																						Blocky fracture.
			S																							
0.9	Coal			Bk	B		X				X	X	MB	2.1	27.5	59.8	10.6	4.9	75.8	1.4	5.8	1.5	13511	9	2570	
			S																							
0.7+	Claystone			Md gy																						Rootworked. *Stigmaria*. Slickensides abundant.

SITE/STATION NO. 76-9	COUNTY: Cambria		COAL SAMPLE NO(S).: 404220/783910/2A, 404220/783910/2B, 404220/783910/2C
COMPANY: Kristianson & Johnson	LAT. °N: 40°42'20"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 78°39'10"	TWP.: Chest	
PERMIT: 56-75	GEOLOGIST: Glover	15' QUADRANGLE: Patton	JOINTING:
SAMPLING METHOD: Channel	DATE: 6-9-76	7 1/2' QUADRANGLE: Hastings	
REPORTED COAL NAMES: Upper Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
16.0	Clay shale			Lt ol gy																						Medium gray to light medium gray at top. Inaccessible.
5.0	Sandstone		S	Md gy to lt ol gy																						Inaccessible.
12.0	Siltstone		G	Lt ol gy																						Few very thin sandstone laminae. Hard.
0.75	Silt shale		G	Dk gy																						Hard.
3.95	Coal	0.6	S	Bk	B			X			X	X	MD	0.7	27.8	61.3	10.2	4.9	78.2	1.4	4.5	0.7	13949	9	2800+	
	Claystone	0.45		Md dk gy																						Rootworked. Stigmaria common. Plant fragments common.
	Coal	1.05		Bk	B		X				X	X	MB	2.4	25.0	68.3	4.3	4.8	82.5	1.4	6.2	0.7	14533	9	2700	Very thin shale partings.
	Fusain	0.15		Bk																						Very thin vitrain bands common.
	Coal	1.7		Bk	B			X				X	M	1.3	32.5	61.3	4.9	5.2	81.9	1.5	5.2	1.3	14713	9	2370	Thin shale partings. Tough.
0.15+	Claystone		S	Md dk gy to md gy																						Rootworked. Stigmaria. Slickensides.

SITE/STATION NO. 76-10	COUNTY: Cambria		COAL SAMPLE NO(S).: 404221/783903/2A, 404221/783903/2B	
COMPANY: Kristianson & Johnson	LAT °N: 40°42'21"	ELEV. (base lower coal):		
MINE: Strip mine	LONG. °W: 78°39'03"	TWP.: Chest		
PERMIT: 56-75	GEOLOGIST: Glover	15' QUADRANGLE: Patton	JOINTING:	
SAMPLING METHOD: Channel	DATE: 6-9-76	7 1/2' QUADRANGLE: Hastings		
REPORTED COAL NAMES: Lower Freeport			WEATHERING: Fresh	

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
20.0+	Silty clay shale			Md gy																						Inaccessible.
3.0+	Coal		S	Bk																						Shale partings (1" thick) in lower 1'.
18.0	Sandstone		S	Lt gy to vy lt gy																						Fine to medium grained.
2.6	Coal	1.35	S	Bk	B		X				X	X	M	3.5	28.6	56.7	11.2	4.7	72.4	1.2	5.9	4.6	13118	9	2210	Few thin pyrite lenses.
	Bone	0.2		Bk																						Hard.
	Coal	1.05		Bk	B			X				X	MD	9.1	23.7	52.3	14.9	5.0	64.8	1.1	11.4	2.8	11552	8½	2425	
1.0+	Claystone		S	Md dk gy to md gy																						Rootworked. *Stigmaria*. Slickensides.

SITE/STATION NO. 76-11	COUNTY: Cambria		COAL SAMPLE NO(S).: 404315/783952/2A, 404315/783952/2B
COMPANY: Kristianson & Johnson	LAT. °N: 40°43'15"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 78°39'52"	TWP.: Chest	
PERMIT: 56-75	GEOLOGIST: Glover	15' QUADRANGLE: Patton	JOINTING:
SAMPLING METHOD: Channel	DATE: 6-9-76	7 1/2' QUADRANGLE: Hastings	
REPORTED COAL NAMES: Upper Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL								COAL ANALYSIS												
						VITRAIN							PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS															
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
12.0+	Sandstone																									Cuts down to within 3 of rider coal in places.
4.0	Carbonaceous clay shale		U	Bk																						
11.0	Clay shale		G	Md lt gy																						Yellow sulfur stain.
1.5	Clay shale		G	Md dk gy																						
0.5	Coal		S	Bk																						Inaccessible.
20.0	Claystone		S	Md dk gy to md gy																						Rootworked. Slickensides.
0.4	Silt shale		G	Bk																						
2.8	Coal	1.9	S	Bk	B		X	X			X	X	MB	3.7	24.0	56.6	15.7	4.6	69.9	1.3	7.8	0.8	12275	8	2545	
	Bone coal	0.1		Bk																						
	Coal	0.8		Bk	B			X			X	X	MB	2.8	22.8	59.1	15.3	4.6	72.1	1.1	6.4	0.5	12629	8½	2800+	
0.3+	Claystone			Ol bk																						Rootworked. *Stigmaria*. Slickensides.

SITE/STATION NO. 77-6	COUNTY: Cambria		COAL SAMPLE NO(S).: 401959/783854/2B
COMPANY: Cooney Bros. Coal Co.	LAT °N: 40°19'59"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 78°38'54"	TWP.: Summerhill	
PERMIT: 238-10	GEOLOGIST: Glover	15' QUADRANGLE: Ebensburg	JOINTING: (Above upper coal): N40W, 75NE (4"-3' spacing).
SAMPLING METHOD: Channel	DATE: 6-8-76	7 1/2' QUADRANGLE: Beaverdale	
REPORTED COAL NAMES: Lower Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Bonded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
8-10	Claystone			Bn																						
20	Clay shale			Bn bk																						
0.75	Coal	0.25		Bk																						
	Binder	0.25		Bk																						
	Coal	0.25		Bk																						
8-10	Clay shale			Bn bk																						
0.6	Carbonaceous shale			Bk																						
10-12	Clay shale			Bn bk																						Claystone in upper 4'.
1.8	Sandstone			Md lt gy																						Micaceous. Siderite lens (2" thick x 3' long).
2.0	Clay shale			Md gy																						Plant fragments abundant.
3.9	Coal	3.6		Bk	B		X				X	X	B	3.0	21.2	67.6	8.2	4.6	78.0	1.5	5.9	1.9	13839	9	2515	Few knife-edge shale partings. Thin pyrite partings.
	Claystone or clay shale	0.05		Bn bk																						
	Coal	0.25		Bk	B			X				X	MB													
0.3+	Silty clay shale			Bn bk																						

SITE/STATION NO. 77-7	COUNTY: Cambria		COAL SAMPLE NO(S).: 401648/784215/2
COMPANY: Cooney Bros. Coal Co.	LAT. °N: 40°16'48"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 78°42'15"	TWP.: Adams	
PERMIT: 238-13	GEOLOGIST: Glover	15' QUADRANGLE: Ebensburg	JOINTING:
SAMPLING METHOD: Channel	DATE: 6-8-76	7 1/2' QUADRANGLE: Beaverdale	
REPORTED COAL NAMES: Brookville coal			WEATHERING: Fresh

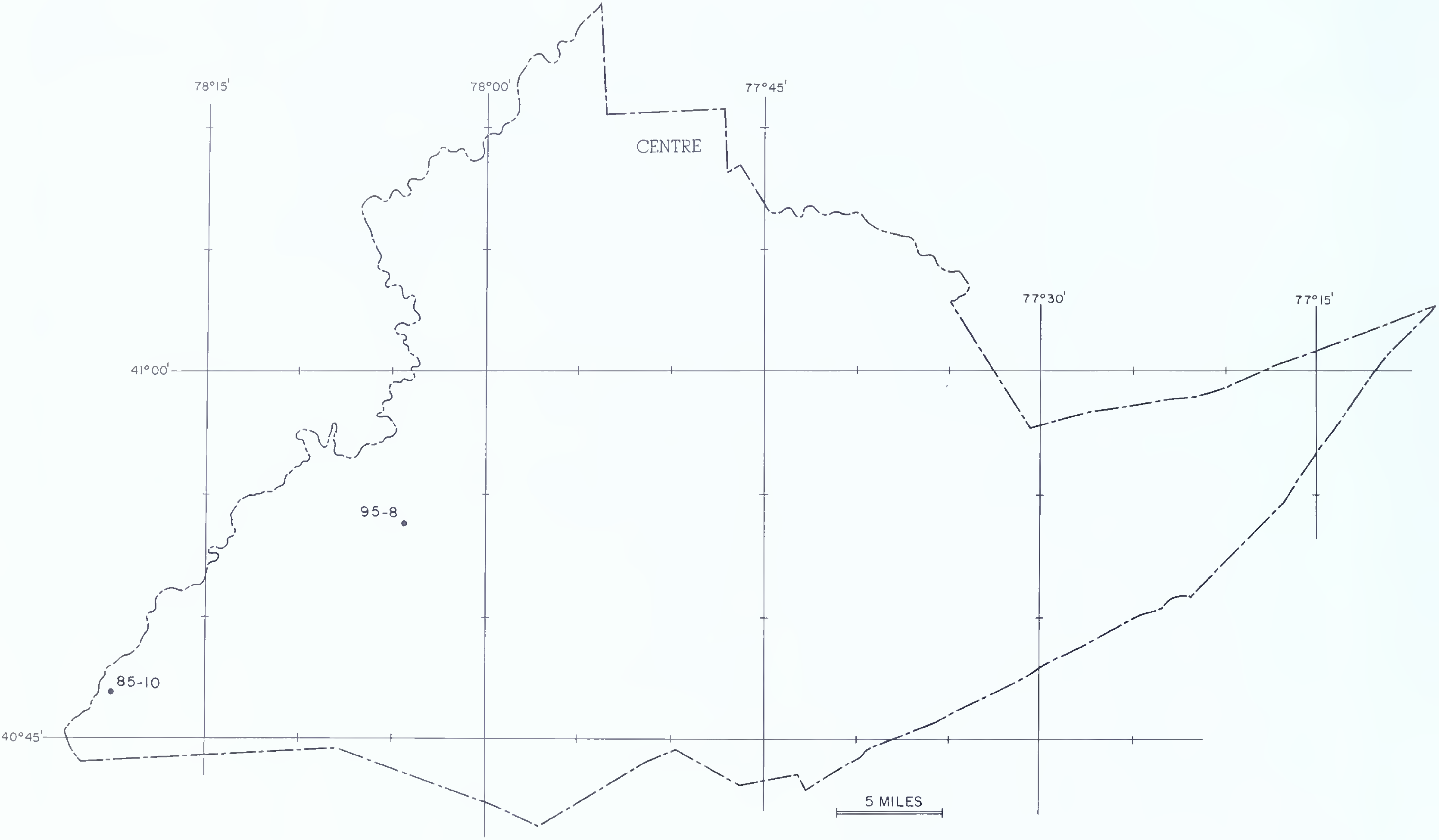
STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
8.0+	Sandstone		S																							
8.0	Silt shale or silty claystone		S																							
12.0	Sandstone		S	01 gn																						
3.0+	Coal		S	Bk																						Too dirty to mine. Sulfur stain; many partings.
2.5	Silty claystone		S																							
1.5	Sandstone		S																							
1.0	Coal		S	Bk																						Yellow sulfur stain. Not mined.
5.0	Claystone		G	Md lt gy																						Rootworked. Stigmaria common. Silty. Yellow sulfur stain.
18.0+	Siltstone		S	Md dk gy																						More massive in upper 6'. Inaccessible.
1.0	Coal	0.25		Bk																						Not mined.
	Bony binder	0.25		Bk																						
	Bone coal	0.5		Bk																						
3.0-5.0	Claystone			Md dk gy to dk gy																						Rootworked. Stigmaria abundant. Darker in top 6". Sulfur common.
3.0	Coal		S	Bk	B		X	X			X	X	M	2.1	17.7	67.2	13.0	4.3	75.1	1.1	5.6	0.9	13133	6	2800+	Sulfur staining.
0.1+	Claystone																									

SITE/STATION NO. 77-8	COUNTY: Cambria	COAL SAMPLE NO(S).: 401903/784035/2A, 401903/784035/2B
COMPANY: Cooney Bros. Coal Co.	LAT °N: 40°19'03" ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 78°40'35" TWP.: Summerhill	
PERMIT: 238-14	GEOLOGIST: Glover 15' QUADRANGLE: Ebensburg	JOINTING:
SAMPLING METHOD: Channel	DATE: 6-8-76 7 1/2' QUADRANGLE: Beaverdale	
REPORTED COAL NAMES: Upper Freeport		WEATHERING: Fresh

STRATIGRAPHIC DATA													COAL ANALYSIS													
					COAL								PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																				
						ABUN-DANCE				THICK-NESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
6+	Sandstone		S	Ol gy																						
6.0-8.0	Clay shale		G	Ol gy																						
1.0	Clay shale		S	Gy bk																						Ostracodes and spores.
3.0-4.0	Silty claystone		S	Lt ol gy																						
50+	Siltstone to sandstone	30+	G	Lt ol gy																						Very fine grained sandstone. Highwall inaccessible.
	Sandstone	20+	U																							Fine to very fine grained.
0-0.5	Clay shale		S	Md gy																						Plant fragments common.
0-1.5	Coal		S	Bk																						Badly weathered. Pyrite staining.
1.0-2.0	Claystone		S	Md gy																						Rootworked. Stigmaria. Yellow sulfur stain.
3.6	Coal	2.1		Bk	B		X				X	X	MB-B	1.9	21.4	67.1	9.6	4.6	78.5	1.5	4.2	1.6	13862	9	2575	Thin shale partings common.
	Bone coal	0.1		Bk																						Thin coaly streaks.
	Coal	1.4	S	Bk	B		X				X	X	B	3.9	18.2	69.4	8.5	4.7	77.4	1.4	6.0	2.2	13559	7	2410	Very thin discontinuous shale partings common.
0.1+	Claystone			Bn bk to bn gy																						Rootworked. Stigmaria. Slickensides.

SITE/STATION NO. 86-2	COUNTY Cambria	COAL SAMPLE NO(S).: 404040/102[illegible]1P
COMPANY: Cambria Coal Co.	LAT °N: 40°40'40" / ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W. 78°28'23" / TWP.: Reade	
PERMIT: 1206-1	GEOLOGIST: Glover / 15' QUADRANGLE: Altoona	JOINTING: (Above coal): N70E, 86SE; N72E, [illegible],
SAMPLING METHOD: Channel	DATE: 6-11-76 / 7 1/2' QUADRANGLE: Blandburg	vert.; N40E, 89NW; N50W, 88NE.
REPORTED COAL NAMES: Upper Freeport		WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Soil																									
5	Clay shale		G																							Inaccessible.
2	Sandstone		S																							Inaccessible.
24	Silt shale		S	Md gy																						
4.8	Clay shale		G	Md dk gy																						Few plant leaves.
3.3	Coal	2.5	S	Bk	B		X				X	X	MB	3.0	25.9	62.0	9.1	5.0	77.7	1.4	6.3	0.5	13750	9	2800+	Few thin shale partings.
	Carbonaceous clay shale	0.3	S	Bk																						
	Coal	0.5	S	Bk	B		X				X	X	B													

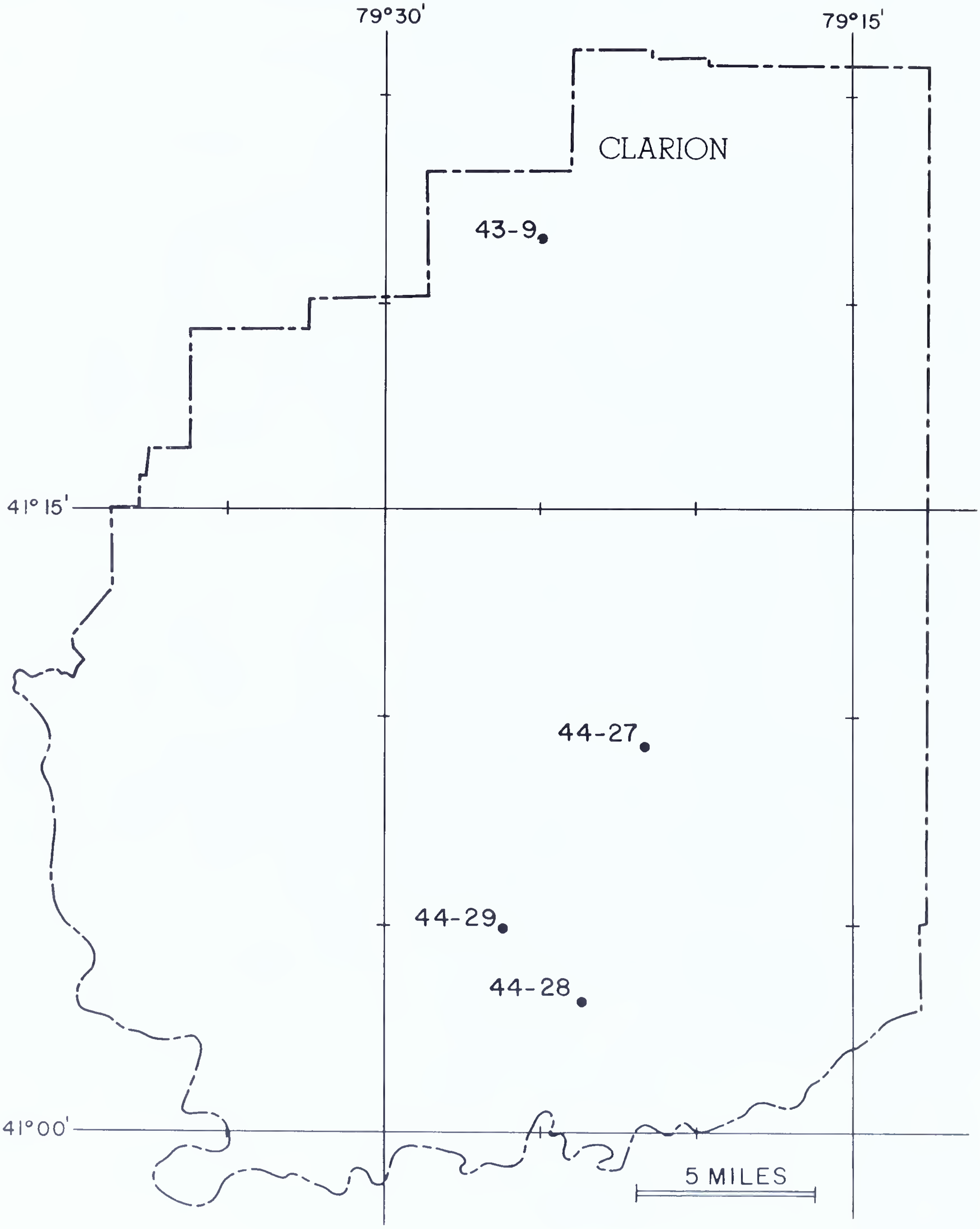

78°15'
78°00'
77°45'
77°30'
77°15'
41°00'
40°45'
CENTRE
95-8
85-10
5 MILES

SITE/STATION NO. 85-10	COUNTY: Centre		COAL SAMPLE NO(S).: 404646/782005/[illegible], 404646/782[illegible], 404647/782002
COMPANY: W. G. Moore & Son	LAT °N: 40°46'46"	ELEV. (base lower coal): 1745'	
MINE: Strip mine	LONG. °W: 78°20'05"	TWP.: Rush	
PERMIT: 313-4	GEOLOGIST: Hempel	15' QUADRANGLE: Houtzdale	JOINTING: Coal cleat (Brookville): N13E, vert. (face); N80W, vert. (butt). Strike and dip on coal: N50E, 15SE.
SAMPLING METHOD: Channel	DATE: 6-24-75	7 1/2' QUADRANGLE: Houtzdale	
REPORTED COAL NAMES: Brookville and Lower Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)									
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Cover																									
10.0+	Silty sandstone			Lt gn																						Plant fragments abundant.
4.0±	Coal (L. Kittanning)		S	Bk	B			X					MD	4.7	21.1	59.1	15.1	4.7	69.3	1.2	8.3	1.4	12080	8½	2910+	
2.0	Claystone		S	Lt gy																						Rootworked.
?	Cover																									
10.0+	Sandy siltstone			Md gn																						Top inaccessible.
12.0	Clay shale			Md ol gn																						Plant fragments abundant. Siderite nodules (1").
3.7	Coal (Brookville)		S	Bk	B		X					X	MB	1.4 1.4	24.9 26.6	58.3 61.7	15.4 10.3	4.1 4.8	71.4 77.6	1.1 1.2	2.8 2.6	5.2 3.5	12720 13500	8½ 8	2190 2130	Pyrite. Sample #404647/782002.
0.3+	Silt shale		S																							Rootworked.

SITE/STATION NO. 95-8
COMPANY: Kristianson & Johnson Coal Co.
MINE: Strip mine
PERMIT: 56-37
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Lower Kittanning
COUNTY: Centre
LAT. °N: 40°58'40"
LONG. °W: 78°04'26"
GEOLOGIST: Hempel
DATE: Summer 1975
ELEV. (base lower coal): 1710'
TWP.: Snow Shoe
15' QUADRANGLE: Philipsburg
7 1/2' QUADRANGLE: Black Moshannon
COAL SAMPLE NO(S).: 405840/780476
JOINTING: Coal cleat: N80W, vert. (face); N10E, vert. (butt).
WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Cover																									
15+	Sandstone			Lt gy																						Plant fragments rare. Channel fill.
2.0	Silt-clay laminite			Lt gy Dk gy																						Coalified plant fragments abundant.
3.1	Coal		S	Bk	B		X				X	X	MD	8.1	21.9	62.9	7.1	5.1	73.6	1.4	12.2	0.6	12790	1½	2910+	Abandoned deep mine.


79°30'
79°15'
CLARION
43-9
41° 15'
44-27
44-29
44-28
41°00'
5 MILES

SITE/STATION NO. 43-9
COMPANY: A. P. Weaver & Sons
MINE: Strip mine
PERMIT: 144-2
SAMPLING METHOD: Channel
REPORTED COAL NAMES:
COUNTY: Clarion
LAT °N: 41°21'37"
LONG. °W: 79°25'01"
GEOLOGIST: Inners & Reardon
DATE: 6-5-75
ELEV. (base lower coal): ~1640'
TWP.: Washington
15' QUADRANGLE: Tionesta
7 1/2' QUADRANGLE: Fryburg
COAL SAMPLE NO(S).: 412137/792501/2A, 412137/792501/2B
JOINTING: Coal cleat: N55W, vert.; N50W, vert. (face); N40E, 88NW; N25E, vert. (butt).
WEATHERING: Fresh

STRATIGRAPHIC DATA													COAL ANALYSIS													
					COAL								PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Shale		S																							
	Coal		S																							
1.0±	Sand-silt laminite		G																							
50.0±	Sandstone		U																							
8.0	Clay shale		S	Dk gy																						Siderite nodules with pyrite and barite.
2.3	Coal	0.8		Bk	B			X			X	X	MD	3.3	42.8	45.2	8.7	5.6	72.7	1.2	9.1	2.7	13200	7	2140	Pyrite abundant.
	Bone	0.2		Gy bk	B				X			X	D													Pyrite abundant.
	Coal	1.3	S	Bk	B			X	X		X	X	MD	2.7	37.5	39.3	20.5	4.8	62.7	1.0	8.2	2.8	11440	5	2500	Bony. Pyrite abundant. Pyritized plant impressions common.
	Claystone			Md lt gy																						Soft, plastic.

SITE/STATION NO. 44-27	COUNTY: Clarion		COAL SAMPLE NO(S).: 410909/792650,[illegible], 41[illegible]
COMPANY: C & K Coal Co.	LAT. °N: 41°09'09"	ELEV. (base lower coal): 1325'	
MINE: Strip mine	LONG. °W: 79°26'50"	TWP.: Monroe	
PERMIT: 4-110	GEOLOGIST: Reardon	15' QUADRANGLE: Clarion	JOINTING: Coal cleat: N51W, 74NE; N69W, [illegible]
SAMPLING METHOD: Channel	DATE: 7-22-75	7 1/2' QUADRANGLE: Clarion	N24E, 81NW. Strike and dip on coal: N29W, [illegible]
REPORTED COAL NAMES: Brookville			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
6.0	Sandstone			Lt gy																						
0-0.5	Coal		U	Bk																						Pinches out and reappears along face of highwall.
15.9	Claystone		S	Md dk gy																						Plant fossils abundant. Few siderite bands.
1.6	Coal	0.8	S	Bk	B			X	X		X	X	B	1.8	40.7	42.3	15.2	4.9	64.5	1.0	3.9	10.5	12140	7	2350	Abundant bands of pyrite.
	Coal	0.8		Bk	B				X		X	X	B	1.5	44.2	44.1	10.2	5.6	72.5	1.3	6.1	4.3	13270	4½	2140	Abundant lenses of pyrite. Thin shale band (<½" thick) 0.6' from base.
	Claystone		S	Dk gy																						Plant fossils.

SITE/STATION NO. 44-28	COUNTY Clarion			COAL SAMPLE NO(S).: 410301/792347	
COMPANY: Terry Reddinger Coal Co.	LAT °N: 41°03'01"	ELEV. (base lower coal):			
MINE: Strip mine	LONG. °W: 79°23'47"	TWP.: Porter			
PERMIT:	GEOLOGIST: Skema	15' QUADRANGLE: Clarion		JOINTING:	
SAMPLING METHOD: Channel	DATE: 5-22-76	7 1/2' QUADRANGLE: Sligo			
REPORTED COAL NAMES:				WEATHERING: Fresh	

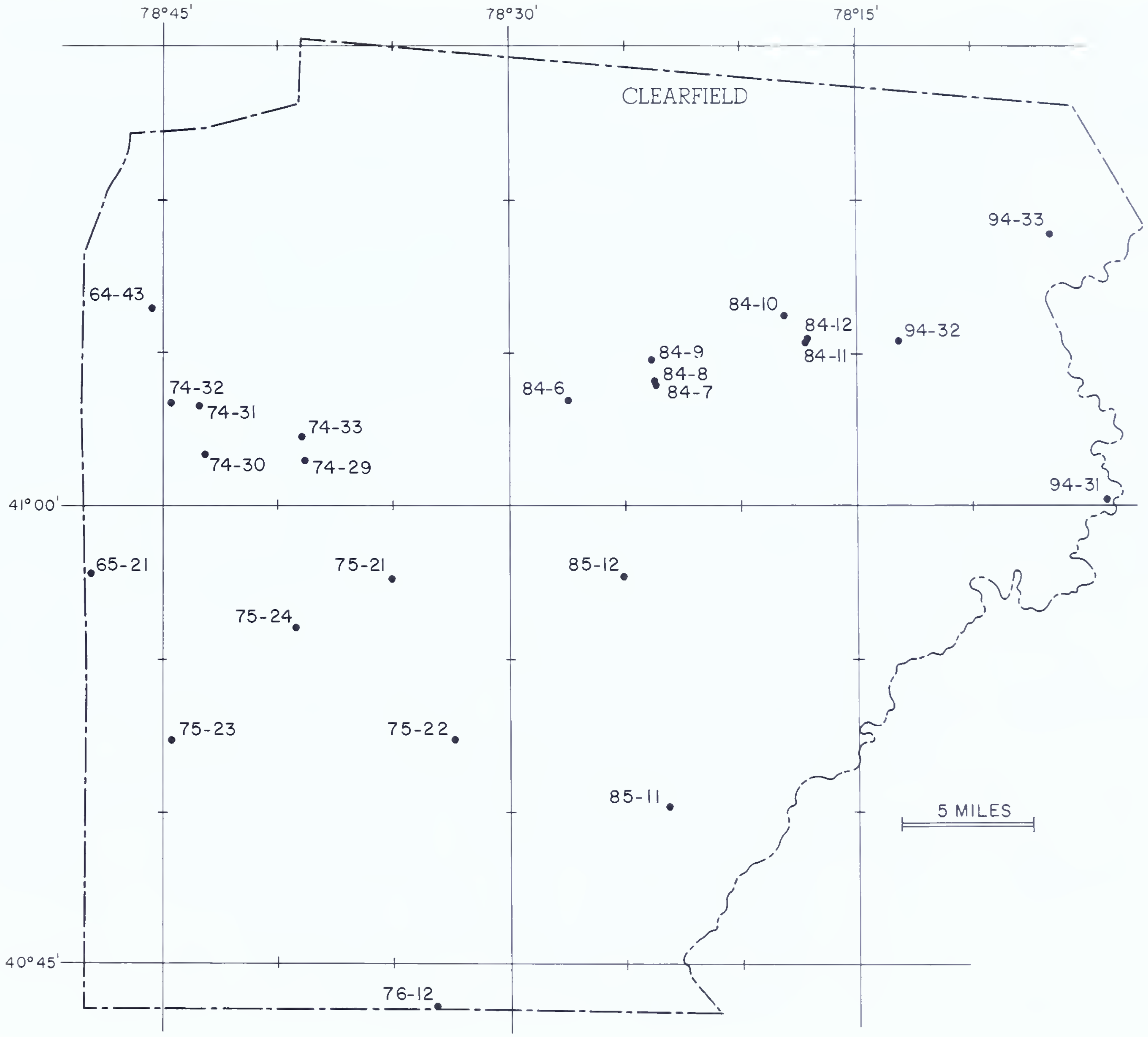
STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.5	Soil		G																							
24.0	Sand-clay laminite		S	Md gy Dk gy																						Sand increases upward. Few plant fragments.
9.1	Clay shale	0.4	S	Md dk gy																						
	Carbonaceous clay shale	0.6	S	Gy bk																						
	Clay shale	8.1	S	Md dk gy																						Plant leaf fragments common. Very thin carbonaceous clay laminae rare. Slightly silty.
1.1	Coal		S	Bk	B			X			X		MD	2.0	39.8	51.6	6.6	5.5	76.6	1.4	8.2	1.7	13910	5½	2200	Pyrite lenses rare.
0.1+	Claystone			Lt ol gy																						Rootworked.

SITE/STATION NO. 44-29 (page 1)	COUNTY Clarion		COAL SAMPLE NO(S). 410453/792607/5A, 410453/792607/5B
COMPANY: Shannon Coal Co.	LAT °N: 41°04'53"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W 79°26'07"	TWP.: Porter	
PERMIT: 1204-2	GEOLOGIST: Skema	15' QUADRANGLE: Clarion	JOINTING: Coal cleat: N46E, vert. (face); N46W, vert.
SAMPLING METHOD: Channel	DATE: 5-22-76	7 1/2' QUADRANGLE: Sligo	(butt). Jointing in limestone: N26W, N21W, N46E (all vert.).
REPORTED COAL NAMES:			WEATHERING: Fresh

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Bonded (B), Non-Bonded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Claystone?	3±																								Inaccessible. Whitish color.
22±	Claystone?	15±																								Inaccessible.
	Clay shale	4±	S																							Limonitic nodules abundant (very irregular shape). Very weathered. Nodules turning to clay and limonite.
5.9	Limestone		S																							Crinoid stems. Shell fragments abundant. Wavy bedding (stromatolitic?).
2.0	Silt shale		S	Lt ol gy																						
20.6	Clay shale	11.2	S	Md dk gy to gy bk																						Coarsens upward. Thin sand laminae at top. Few pelecypods. Siderite nodules abundant.
	Clay shale	9.4	S	Md dk gy																						Subfissile. Silty at base. Siderite nodules abundant.
0.2	Coal		G	Bk	B				X			X	D													
0.3	Carbonaceous clay shale		G	Gy bk																						Very thin vitrain laminae common.
0.4	Clay shale		S	Md gy																						
5.6	Sandstone			Md lt gy																						Crossbedded. Foreset beds dip ~20NE. Fining upward.

SITE/STATION NO. 44-29 (page 2)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: ELEV. (base lower coal):	
MINE:	LONG. °W: TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S= Sharp, G= Gradational, U= Uncon)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.7	Coal	0.25	S	Bk	B			X	X			X	M	1.6	37.5	51.7	9.2	5.4	74.1	1.5	6.7	3.1	13570	5	2015	Bony.
	Coal	0.45	S	Bk	B		X				X		MB	2.1	34.5	41.9	21.5	5.0	61.7	1.2	6.9	3.7	11420	4	2505	Rare small pyrite lenses.
4.2	Claystone		S	Md gy																						Rootworked. Fines upward. Silty. Slightly sandy at base.
1.6	Sandstone		S	Lt gy																						
7.1	Sand-silt laminite		S	Dk gy to gy bk Md lt gy																						Thickness of sand beds increases upward (¼"-½"). Plant fragments rare. Siderite nodules common.
0.05+	Coal			Bk																						


78°45'
78°30'
78°15'
CLEARFIELD
94-33
64-43
84-10
84-12
94-32
84-9
84-11
84-8
84-7
84-6
74-32
74-31
74-33
74-30
74-29
94-31
41°00'
65-21
75-21
85-12
75-24
75-23
75-22
85-11
5 MILES
40°45'
76-12

SITE/STATION NO. 64-43 (page 1)
COMPANY: DuBois Highland School
MINE: Drill hole #6
PERMIT:
SAMPLING METHOD: Drill core
REPORTED COAL NAMES: Mahoning and Upper Freeport

COUNTY: Clearfield
LAT. °N: 41°06'32"
LONG. °W: 78°45'35"
GEOLOGIST: Inners & Glover
DATE: 5-13-75

ELEV.: Surface ~1530'
TWP.: Sandy
15' QUADRANGLE: DuBois
7 1/2' QUADRANGLE: DuBois

COAL SAMPLE NO(S).: 410632/784535/A, B, C, D, E, F, G
JOINTING:
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2.0	Soil																									
3.0	No samples																									
3.5	Sand-silt laminite			Md lt gy																						Fine-grained sand. Ripple cross laminations. Micaceous partings.
1.3	Siltstone		G	Gn gy																						Thick bedded.
2.5	Sand-silt laminite		G	Md lt gy																						Fine- to very fine grained sand. Ripple cross laminations. Micaceous partings.
0.1	Siltstone		G	Gn gy																						
0.4	Sand-silt laminite			Lt gy																						Fine- to very fine grained sand. Plane bedding. Micaceous.
0.3	Siltstone			Gn gy																						Micaceous.
0.4	Sand-silt laminite			Md lt gy																						Fine- to very fine grained sand. Wavy cross laminations. Predominantly sand.
1.2	Siltstone			Gn gy																						
0.9	Sandstone and siltstone interbedded			Gn gy Md lt gy																						Cross laminations in sandstone.
3.4	Siltstone			Md lt gy to gn gy																						Thick bedded. Hard.
1.3	Siltstone			Md lt gy																						Thick bedded.

SITE/STATION NO. 64-43 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA: THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded(B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE >60%	30-60%	15-30%	<15%	VITRAIN THICKNESS >5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	COAL ANALYSIS PROXIMATE (%): MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%): HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1.6	Siltstone		G	Lt gy																						Micaceous. Upper 0.[illegible]' deeply weathered, rusty stained, and broken.
0.4	Siltstone			Md gy																						Very calcareous. very hard. Thick bedded.
10.5	Silty clay shale			Md gy																						Thick bedded, with few thin siltstone laminae and beds. Convolute bedding in siltstone laminae at 26.4'. Cross-laminated siltstone bed (0.1' thick) at 31.5'.
0.6	Sandstone			Md lt gy																						One bed.
3.1	Silty clay shale			Md gy																						Thick bedded. Few plant fossil stems in lower 1.0'.
0.7	Clay shale			Md gy																						Somewhat silty. Few plant fossil stems.
2.5	Silty clay shale			Md gy																						Thick bedded.
1.4	Silt-clay laminite			Md gy																						
5.8	Silty clay shale			Md gy																						Thick bedded.
4.1	Silt-clay laminite			Md gy																						
4.3	Silty clay shale			Md gy																						Widely separated medium-light-gray siltstone beds to 10 mm thick.
0.9	Silt-clay laminite			Md gy																						
9.1	Silty clay shale			Md gy																						Mica abundant. Plant fossils (stems, leaves) abundant. Limestone nodules to ½" diameter rare.

SITE/STATION NO. 64-43 (page 3)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S= Sharp, G= Gradational, U= Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
11.1	Silty clay shale			Md gy																						Few plant fossils.
3.1	Clay shale			Md dk gy																						Pelecypods common; few brachiopods.
1.5	Siltstone			Dk gy																						Very highly calcareous, bituminous. Mica common. Invertebrate fossils (brachiopods, pelecypods) abundant.
5.0	Silty clay shale			Md dk gy																						Invertebrate fossils rare.
1.6	Silt-clay laminite			Dk gy																						Clay laminae thicker than silt. Pyritic.
0.4	Coaly shale			Gy bk to bk	B				X			X	D													Attritus very shaly.
2.6	Claystone			Md lt gy																						Slickensides abundant. Rootworked.
3.4	Clay shale			Md lt gy																						Thick bedded.
1.5	Clay shale			Md dk gy																						
0.2	Siltstone			Md gy																						Hard, somewhat sandy (one bed).
28.2	Clay shale			Md gy to dk gy																						Siderite nodules common (2" maximum diameter).
0.6	Siltstone			Dk gy																						Very calcareous. Invertebrate fossils abundant.

SITE/STATION NO. 64-43 (page 4)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1.3	Shale			Bk																						Carbonaceous. Plant stems common.
0.4	Coal (Mahoning)			Bk	B			X				X	M	1.3	30.8	47.7	20.2	4.5	65.3	1.3	3.6	5.1	11860	5	2040	Shale partings common in lower 0.2'.
6.3	Claystone			Md lt gy																						Slickensides common. Freshwater limestone nodules 0.5'-2.5' above base.
11.7	Sand-silt laminite			Lt gy Md gy																						Fine-grained sand. About 60 silt.
9.0	Clay shale			Md gy to dk gy																						Few silt laminae in upper 2.0'. Few siderite bands.
8.4	Clay shale			Md lt gy to md to dk gy																						Few siderite nodules and zones in upper 5.5'. Lower 2.0' hard, and contains few coalified plant stems.
3.2 (Upper split of Upper Freeport "E" coal)	Coal	0.4		Bk	B			X				X	M	0.6	28.5	44.7	26.7	4.2	61.2	0.6	5.6	2.2	10950	5½	2460	
	Shale parting	0.4		Bk																						Carbonaceous. Tough. Few very thin coal streaks.
	Coal	1.1		Bk	B		X				X	X	MB	1.1	29.9	54.5	14.5	4.8	72.9	0.7	5.6	1.5	13020	5½	2560	Small amount of white sulfur stain.
	Shale parting	0.05		Bk																						Carbonaceous.
	Coal	0.25		Bk	B		X	X				X	M	1.4	23.7	36.8	38.1	3.6	50.7	0.5	5.7	1.4	8920	4	2840	
	Shale parting	0.1		Bk																						Carbonaceous. Tough.
	Coal	0.9		Bk	B		X			X	X		MB	1.1	32.7	58.4	7.8	5.1	78.2	0.8	5.9	2.2	14040	7½	2190	

SITE/STATION NO. 64-43 (page 5)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S= Sharp, G= Gradational, U= Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.4	Shale		G	Bk																						Carbonaceous. Blocky fracture. Few very thin coal streaks.
9.2	Claystone			Md gy (upper 0.2' md dk gy)																						Slickensides common.
1.5	Shale			Bk (upper 1.0' md gy)																						Carbonaceous. Few very thin coal streaks in lower part. Few coalified plant stems and fragments.
1.1	Coaly shale			Bk																						Two coal streaks up to 0.1' thick; few very thin coal streaks. Coalified plant stems common.
1.3	Shale			Bk																						Carbonaceous. Few very thin coal streaks. Coalified plant stems common.
3.35 (Upper Freeport "E" coal)	Coal	2.4		Bk	B			X				X	MD	1.0	24.2	41.0	33.8	3.7	54.4	0.5	4.4	3.2	9680	4½	2400	Thin black shale partings.
	Shale parting	0.05		Bk																						
	Coal	0.9		Bk	B			X				X	MD	1.3	25.8	42.9	30.0	3.8	57.3	0.5	4.7	3.7	10260	5½	2350	Thin black shale partings.
3.75	Silty claystone			Md lt gy																						Few slickensides. Few very thin light-gray siltstone streaks and partings.

SITE/STATION NO. 64-43 (page 6)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
4.6	Claystone		G																							Siltstone streaks more common. Plant fragments (leaves) rare.
9.8	Siltstone			Md gy																						Clay shale or claystone streaks common. Subfissile. Siltstone increases downward.
3.3	Silt-clay laminite																									Silt predominates. Lower 1.0' is interbedded silt and clay shale (light-gray and medium-gray).
1.9	Siltstone																									Very faint color mottling. Homogeneous.
29.1	Sand-silt laminite			Lt gy Md gy																						Mica common on bedding planes. Rare plant fragments.
14.15	Sandstone			Lt gy																						Fine to medium grained. Mica common on bedding planes.
2.55	Sand-silt laminite			Md lt gy Md dk gy																						Sandstone (fine- to medium-grained) predominates. Coal and coalified plant materials common in lower part.
1.3	Sand-silt laminite																									Silt predominates.
17.5	Sandstone																									Medium grained. Mica common. Coalified and carbonaceous plant fragments. Dark siltstone or silt shale fragments in upper part.

SITE/STATION NO. 64-43 (page 7)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.9	Sandstone																									Medium grained. Siderite nodules and medium-dark-gray shale fragments common. Few thin siltstone laminae.
19.8	Sandstone																									Medium to coarse grained. Few very thin coaly streaks in lower 0.3'. Mica common.
0.7	Sandstone																									Fine grained. Mica and carbonaceous material on parting planes. Few thin dark shale streaks in upper 0.15'.

SITE/STATION NO.	65-21	COUNTY:	Clearfield		
COMPANY:	P & N Coal Co.	LAT °N:	40°57'47"	ELEV. (base lower coal):	~1850'
MINE:	Strip mine	LONG. °W:	78°48'07"	TWP.:	Bell
PERMIT:	32-65	GEOLOGIST:	Hempel	15' QUADRANGLE:	Punxsutawney
SAMPLING METHOD:	Channel	DATE:	6-4-75	7 1/2' QUADRANGLE:	McGees Mills
REPORTED COAL NAMES:	Upper Kittanning				

COAL SAMPLE NO(S).: 405747/784807/2A, 405747/784807/2B, 405749/784807/2A, 405749/784807/2B

JOINTING: Coal cleat: N66W, vert.; N64W, vert.; N73W, vert. (face); N10W, vert.; N7W, vert.; N30W, vert. (butt). Jointing above coal: N10W, vert. (10' spacing); N73E, vert. (4' spacing).

WEATHERING: Fresh

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	COAL: Bonded (B), Non-Bonded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
8.0	Silt-clay laminite		G	Dk gy																						
5.0	Claystone		S	Ol gy																						Plant fragments abundant.
2.9	Coal	2.1	S	Bk	B		X				X		M	1.9 4.5	32.5 28.3	52.8 62.1	12.8 5.1	4.8 5.2	73.4 77.0	1.3 1.3	6.1 10.9	1.6 0.5	13090 13530	8 3	2400 2910+	Sample #405749/784807/2B.
	Claystone	0.1	S	Gy bk																						Plant fragments common.
	Coal	0.7	S	Bk	B		X					X	B	2.6 8.7	33.5 28.3	51.5 55.8	12.4 7.2	4.9 5.1	70.1 71.2	1.2 1.2	4.4 14.2	7.0 1.1	12820 12540	7½ 6½	2180 2360	Pyrite lenses. Sample #405749/784807/2A.
	Claystone			Md gy																						Rootworked.

SITE/STATION NO. 74-29	COUNTY: Clearfield		COAL SAMPLE NO(S).: 410132/783857, 410131/783854
COMPANY: McDonald Land & Mining Co.	LAT °N: 41°01'32"	ELEV. (base lower coal): 1949'	
MINE: Strip mine	LONG. °W: 78°38'57"	TWP.: Bloom	JOINTING: Coal cleat: N75W, vert.; N65W, vert.; N75W, vert. (face); N10W, vert.; N30W, vert.; N20W, vert. (butt). Jointing above coal: N70W, vert.; N70E, vert.
PERMIT: 659-3	GEOLOGIST: Hempel	15' QUADRANGLE: Penfield	
SAMPLING METHOD: Channel	DATE: Summer 1975	7 1/2' QUADRANGLE: Luthersburg	
REPORTED COAL NAMES: Lower Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Cover			Md dk gy																						
8.0±	Siltstone			Lt gy																						
5.0±	Sandstone		S	Md gy																						Mica flakes in sand.
4.5	Siltstone		S	Md gy																						Abundant plant fossils. Few siderite nodules scattered throughout.
3.5	Silty claystone		G	Bk																						Abundant plant fossils. Siderite nodules along bedding planes.
1.9	Coal		S	Bk	B			X				X	B	2.7	28.9	63.6	4.8	5.1	80.6	1.2	6.7	1.6	14260	8½	2140	For trace element analysis, see sample #410132/783857.
														1.2	25.2	54.8	18.8	4.3	68.5	1.1	3.4	3.9	12040	4	2380	For trace element analysis, see sample #410131/783854.
0.3	Claystone		S	Dk gy																						Rootworked.

SITE/STATION NO. 74-30
COMPANY: Benjamin Coal Co.
MINE: Strip mine
PERMIT: 64-100
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Upper Kittanning

COUNTY: Clearfield
LAT °N: 41°01'45"
LONG. °W: 78°43'18"
GEOLOGIST: Hempel
DATE: Summer 1975

ELEV. (base lower coal): 1790'
TWP.: Brady
15' QUADRANGLE: Penfield
7 1/2' QUADRANGLE: Luthersburg

COAL SAMPLE NO(S).: 410145/784318, 410146/784316
JOINTING: Coal cleat: N55E, vert.; N50E, vert.; N55E, vert. (face); N65W, vert.; N62W, vert.; N65W, vert. (butt). Strike and dip on coal: N60W, S
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3	Soil and cover		S	Lt bn																						
5.3	Silt shale		S	Dk gy																						Plant fragments abundant. Jointing: N65E, vert.; N75W, vert.; N5E, vert.
2.1	Coal		G	Bk	B			X			X	X	B	1.2	29.6	60.4	8.8	5.1	78.6	1.2	4.9	1.4	13900	8	2450	Pyrite. For trace element analysis, see sample #410146/784316.
														3.0	25.0	63.3	8.7	4.8	75.8	1.3	7.2	2.2	13410	9	2280	Clay parting 0.5' from top (2" thick), not continuous. For trace element analysis, see sample #410145/784318.
	Claystone			Md gy																						Rootworked.

SITE/STATION NO. 74-31	COUNTY Clearfield	COAL SAMPLE NO(S).: 410312/784331/2
COMPANY: Lee Simpson & Associates	LAT. °N 41°03'12" ELEV. (base lower coal): ~1763'	
MINE: Site 2, drill hole #3	LONG. °W 78°43'31" TWP.: Brady	
PERMIT:	GEOLOGIST Hempel 15' QUADRANGLE: Penfield	JOINTING:
SAMPLING METHOD: Core	DATE: 2-4-75 7 1/2' QUADRANGLE: Luthersburg	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2.3	Coal	1.3		Bk	B		X				X	X	MB	1.4	30.3	57.3	11.0	4.8	76.5	1.3	4.6	1.8	13500	8	2300	Depth to top of coal, 64.9'. Few thin shale partings.
	Carbonaceous shale	0.1	S	Bk																						
	Coal	0.9	S	Bk	B		X				X		MB	1.4	29.4	55.8	13.4	4.6	71.0	1.2	3.5	6.3	12880	7	2140	Pyrite common. Few thin shale partings.
	Clay shale		S																							

SITE/STATION NO.: 74-32	COUNTY: Clearfield		COAL SAMPLE NO(S).: 410318/784448 1A
COMPANY: Benjamin Coal Co.	LAT. °N: 41°03'18"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 78°44'48"	TWP.: Brady	
PERMIT: 64-64	GEOLOGIST: Hempel	15' QUADRANGLE: Penfield	JOINTING: Coal cleat: N50W, vert.; N53W, vert. face.
SAMPLING METHOD: Channel	DATE: 6-9-74	7 1/2' QUADRANGLE: Luthersburg	Jointing in sandstone: N45E, vert.; N20W, vert.
REPORTED COAL NAMES: Upper Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Cover																									
10.0±	Silty sandstone		G	Md dk gy																						Plant fragments common.
18.0	Clayey siltstone		S	Md gy																						Sandy at top.
3.2	Coal		S	Bk	B		X				X		B	4.0	28.1	57.4	10.5	5.0	73.8	1.3	6.9	2.5	13170	8	2170	Pyrite lenses abundant.
	Claystone		S	Lt gy																						Rootworked. Abundant plant fragments.

SITE/STATION NO. 74-33	COUNTY: Clearfield	COAL SAMPLE NO(S).: 410215/783901
COMPANY: McDonald Land & Mining Co.	LAT °N: 41°02'15" ELEV. (base lower coal): 1940'	
MINE: Strip mine	LONG. °W: 78°39'01" TWP.: Bloom	
PERMIT: 659-1	GEOLOGIST: Hempel 15' QUADRANGLE: Penfield	JOINTING: Coal cleat: N70W, vert.; N75W, vert.; N68W, vert. (face); N40E, vert.; N45E, vert.; N36E, vert. (butt).
SAMPLING METHOD: Channel	DATE: 6-9-75 7 1/2' QUADRANGLE: Luthersburg	
REPORTED COAL NAMES: Brookville		WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Bonded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Cover																									
5+	Sandstone			Pale yel or.																						Plant fossils (Lepidodendron). Medium grained.
0.5	Coal			Bk	B				X			X	D													
5.9	Clay shale			Bk																						Rootworked at top. Plant fragments common. Small sand lenses up to 1" thick.
4.2	Siltstone			Md gy																						Rare plant fragments. Siderite nodules (1" to 10").
2.0	Coal			Bk	B			X				X	D	1.5	25.8	60.1	12.6	4.5	74.3	1.2	5.5	1.9	13050	6	2570	For trace element analysis, see sample #410215/783901.
0.3+	Claystone			Md dk gy																						

SITE/STATION NO.	75-21 (page 1)	COUNTY:	Clearfield	COAL SAMPLE NO(S).:	405737/783505/1A, 405737/783505/1B, 405735/783503
COMPANY:	Shale Hill Coal Co.	LAT. °N: 40°57'37"	ELEV. (base lower coal): 1722'		
MINE:	Strip mine	LONG. °W: 78°35'05"	TWP.: Penn	JOINTING:	Coal cleat (Lower Freeport): N80W, vert.; N71W, vert.; N73W, vert. (face); N5E, vert.; N-S, vert.; N8E, vert. (butt). Strike and dip on coal: N3E, 3SE.
PERMIT:	14-39	GEOLOGIST: Hempel	15' QUADRANGLE: Curwensville		
SAMPLING METHOD:	Channel	DATE: Summer 1975	7 1/2' QUADRANGLE: Curwensville		
REPORTED COAL NAMES:	Lower and Upper Freeport			WEATHERING:	Fresh to weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, med-bright, mid-lustrous, med-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2.2	Coal (Upper Freeport)			Bk	B			X					D	1.3	17.3	36.2	45.2	2.4	35.0	0.4	2.0	15.0	6700	0	2030	1
1-3	Clay shale			Md gy and bk																						Black, carbonaceous clay laminae interbedded with medium-gray clay. Rootworked. Plant fossils abundant.
15+	Siltstone			Lt ol bn																						Gradually sandier toward top. Rootworked. Plant fossils abundant.
1.2	Claystone			Gy bk to dk gy																						Rootworked.
12±	Sand-clay laminite			Md bn																						
4.1	Sandy, clayey siltstone		G	Lt bn																						Gradually sandier toward top. Siderite nodules.
2.8	Claystone		G	Vy lt gy to lt bn																						Plant fossils rare. Grades to light brown at top.
2.6	Silty sandstone		G	Ol gy																						Plant fossils common.
5.8	Clayey siltstone		S	Md lt gy																						Abundant plant fossils.
	Coal	1.3	S	Bk	B			X					M	4.4	19.9	47.4	28.3	3.8	56.0	0.9	7.1	3.9	9710	3	2520	Abundant plant fossils.2
	Carbonaceous clay shale	0.1	S	Bk																						
3.5 (Lower Freeport)	Coal	1.4		Bk	B			X			X	X	B													

SITE/STATION NO. 75-21 (page 2)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT °N: ELEV. (base lower coal):	
MINE:	LONG. °W: TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Carbonaceous clay shale	0.2	S	Dk gy										1.4	18.7	55.2	24.7	3.6	62.1	0.9	4.3	4.4	11010	7½	2460	Abundant plant fragments in clay shale parting.[3]
	Coal	0.5	S	Bk	B				X		X		B													
0.3	Claystone		S	Dk gy																						Rootworked.

[1] For trace element analysis, see sample #405735/783503.

[2] For trace element analysis, see sample #405737/783505/1B.

[3] For trace element analysis, see sample #405737/783505/1A.

SITE/STATION NO. 75-22 (page 1)	COUNTY: Clearfield		COAL SAMPLE NO(S).: 405210/783232/2A, 405210/783232 [illegible], 405210/783232/6A, 405210/783232 6B
COMPANY: Simca Mining Co.	LAT. °N: 40°52'10"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 78°32'32"	TWP.: Knox	
PERMIT: 529-5	GEOLOGIST: Glover	15' QUADRANGLE: Curwensville	JOINTING: (In siltstone above L.F.): N87W, vert.; [illegible],
SAMPLING METHOD: Channel	DATE: 7-9-76	7 1/2' QUADRANGLE: Irvona	vert. (2'-4' spacing).
REPORTED COAL NAMES: Lower Freeport and Upper Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10+	Sandstone																									Inaccessible.
22	Silt shale	10		Ol gy																						Inaccessible.
	Silt shale	12		Md gy																						Inaccessible.
1.5	Clay shale		S	Bk																						
2.1 (Upper Freeport)	Coal	1.4		Bk	B		X				X	X	MB	1.1	26.7	58.2	14.0	4.7	73.4	1.4	3.6	2.9	13230	9	2200	Few very thin shale partings near top.
	Bone coal	0.1		Bk																						Hard.
	Coal	0.6		Bk	B			X				X	MB	1.8	26.1	52.4	19.7	4.6	67.9	1.3	4.3	2.2	12170	9	2265	Peacock coloring.
3.5+	Claystone																									Silty. Slickensides common.
10	Cover																									Looks like silty claystone (no internal bedding, medium-gray color).
25	Sand-silt laminite		G	Lt gy Md dk gy																						Very fine grained sand. 70% silt. Siderite nodules common. Plant fragments common on bedding planes.
3.5	Siltstone			Md dk gy																						Few plant fragments. Few siderite bands and nodules.
2.5 (Lower Freeport)	Coal	1.3		Bk	B		X				X	X	MB	2.1	24.9	65.7	7.3	5.0	79.2	1.4	4.1	3.0	14040	9	2065	Thin shale and bone partings common.
	Bone coal	0.1		Bk																						Hard.
	Coal	1.1		Bk	B		X				X	X	B	3.9	28.6	61.4	6.1	5.3	79.0	1.4	6.5	1.7	14050	9	2415	Few thin, discontinuous shale partings.

SITE/STATION NO. 75-22 (page 2)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA: THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded (B), Non-Bonded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	COAL ANALYSIS: PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.1+	Claystone			Lt bn gy																						Slickensides common.

SITE/STATION NO. 75-23	COUNTY Clearfield		COAL SAMPLE NO(S).: 405216/784427/2A, 405216/784427/2B
COMPANY: Head Coal Co.	LAT. °N: 40°52'16"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W 78°44'27"	TWP.: Bell	
PERMIT:	GEOLOGIST: Glover	15' QUADRANGLE: Curwensville	JOINTING:
SAMPLING METHOD: Channel	DATE: 6-10-76	7 1/2' QUADRANGLE: Westover	
REPORTED COAL NAMES: Lower Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Clay shale																									
3.1	Coal	1.1		Bk	B		X	X			X	X	MB	1.6	28.1	61.4	8.9	5.0	77.1	1.3	4.7	3.0	13830	9	2175	
	Bone coal	0.15		Bk																						Hard thin vitrain stringers.
	Coal	1.6		Bk	B			X				X	MB	1.9	28.6	59.4	10.1	4.9	75.3	1.2	5.8	2.7	13454	9	2430	Pyrite flakes at base.
	Bone coal	0.25		Bk																						Hard.
0.1+	Claystone			Bn gy																						Rootworked. Stigmaria. Slickensides.

SITE/STATION NO.	75-24	COUNTY	Clearfield			COAL SAMPLE NO(S).:	405600/783923
COMPANY:	Benjamin Coal Co.	LAT. °N:	40°56'00"	ELEV. (base lower coal):	1600'		
MINE:	Strip mine	LONG. °W:	78°39'23"	TWP.:	Greenwood		
PERMIT:	64-75	GEOLOGIST:	Hempel	15' QUADRANGLE:	Curwensville	JOINTING:	
SAMPLING METHOD:	Channel	DATE:	Summer 1975	7 1/2' QUADRANGLE:	Mahaffey		
REPORTED COAL NAMES:	Lower Freeport					WEATHERING:	Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S= Sharp, G= Gradational, U= Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
15±	Siltstone			Dk gy																						Plant fossils abundant. 10'± of highwall above siltstone inaccessible.
2.8	Bone coal	0.5			B				X			X	D													Hard, contains clay.
	Coal	2.3			B		X				X		B	1.4	26.5	62.7	9.4	4.9	78.0	1.5	5.6	0.6	13810	9	2590	Pyrite abundant. For trace element analysis, see sample #405600/783923.

SITE/STATION NO. 76-12
COMPANY: Cambria Coal Co.
MINE: Strip mine
PERMIT: 1206-5
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Upper Freeport?

COUNTY Clearfield
LAT. °N: 40°43'38"
LONG. °W: 78°33'10"
GEOLOGIST: Glover
DATE: 6-7-76

ELEV. (base lower coal):
TWP.: Beccaria
15' QUADRANGLE: Patton
7 1/2' QUADRANGLE: Coalport

COAL SAMPLE NO(S).: 404338/783310/1B
JOINTING:
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
20.0+	Sandstone		S	Lt ol gy																						Fine to very fine grained. Very micaceous.
4.0	Shale		S																							Inaccessible.
1.0-3.0	Sandstone		S	Md lt gy																						
14.0-15.0	Clay shale		S	Dk gy to md gy																						Possible conchostracans 2.5' above base.
1.0	Carbonaceous clay shale			Bk to gy bk																						Few plant leaves, stems.
2.6+	Coal	2.4			B	X	X					X	B	1.7	24.2	61.2	12.9	4.7	73.3	1.4	4.0	3.6	13253	9	2190	Rare pyrite blebs. Few knife-edge shale partings.
	Bone coal	0.2+																								

SITE/STATION NO. 84-6	COUNTY: Clearfield		COAL SAMPLE NO(S).: 410321/782737, 410320/782738
COMPANY: Benjamin Coal Co.	LAT. °N: 41°03'21"	ELEV. (base lower coal): 1547'	
MINE: Strip mine	LONG. °W: 78°27'37"	TWP.: Lawrence	
PERMIT: 64-98	GEOLOGIST: Hempel	15' QUADRANGLE: Clearfield	JOINTING: Coal cleat: N80W, vert.; N82W, vert. (face);
SAMPLING METHOD: Channel	DATE: Summer 1975	7 1/2' QUADRANGLE: Clearfield	N10E, vert.; N-S, vert. (butt).
REPORTED COAL NAMES: Lower Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Cover																									
10-20	Sandstone		S	Lt gy																						Thickens to the east. Channel fill.
5.5	Siltstone		S	Md dk gy																						Plant fragments common.
2.6	Coal		S	Bk	B		X			X			MB	9.1	20.8	51.3	18.8	4.6	60.4	1.0	9.4	5.8	10750	8½	2040	
														0.9	24.4	64.8	9.9	4.8	78.1	1.2	2.1	3.9	13890	9	2070	Sample #410320/782738.
	Claystone			Md lt gy																						Rootworked.

SITE/STATION NO. 84-7	COUNTY Clearfield		COAL SAMPLE NO(S).: 410358/782341/1A
COMPANY: Shawville Coal	LAT °N: 41°03'58"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 78°23'41"	TWP. Goshen	
PERMIT: 30-16	GEOLOGIST: Hempel	15' QUADRANGLE: Clearfield	JOINTING: Coal cleat: N81E, vert.; N85E, vert.; [illegible],
SAMPLING METHOD: Channel	DATE: Summer 1975	7 1/2' QUADRANGLE: Clearfield	vert. (face); N5E, vert.; N1W, vert.; N-S, vert. (butt).
REPORTED COAL NAMES: Middle Kittanning			WEATHERING: Fresh to weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
25.0±	Sandy siltstone			Md gy																						Jointing: N60W, vert.; N75W, vert.; N40E. Top ~10' inaccessible but looks sandy.
2.1	Coal		S	Bk	B		X					X	MB	3.9	24.8	57.6	13.7	4.6	72.1	1.3	6.3	2.0	12710	9	2430	Pyrite lenses.
0.3+	Claystone		S	Dk gy																						Pyrite streaks (<2 mm). Rootworked.

SITE/STATION NO. 84-8	COUNTY: Clearfield	COAL SAMPLE NO(S).: 400401/782344/3A, 3B
COMPANY: Shawville Coal	LAT °N: $41^{0}04'01''$ ELEV. (base lower coal): 1520'	
MINE: Strip mine	LONG. °W: $78^{0}23'44''$ TWP.: Goshen	
PERMIT: 30-16	GEOLOGIST: Hempel 15' QUADRANGLE: Clearfield	JOINTING: Strike and dip on coal: N15E, 4SE.
SAMPLING METHOD: Channel	DATE: Summer 1975 7 1/2' QUADRANGLE: Clearfield	
REPORTED COAL NAMES: Upper Kittanning		WEATHERING: Fresh to weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10.0+	Sandstone			Lt bn gy																						Plant fossils abundant. Coal streaks abundant in bottom 4'. Crossbedded.
1.5	Coal	0.5	S	Bk	B				X			X	B	7.1	23.2	56.5	13.2	4.6	68.1	1.0	12.5	0.6	11790	2	2910+	Near crop line.
	Claystone	0.1	S	Yl gy																						Plant fragments.
	Coal	0.9	S	Bk	B		X				X		B	9.0	22.1	44.6	24.3	4.3	54.7	0.9	15.3	0.5	9390	½	2910+	
0.3+	Claystone			Yl bn ol																						Rootworked.

SITE/STATION NO. 84-9	COUNTY: Clearfield		COAL SAMPLE NO(S).: 410450/782358, 410451/782356
COMPANY: Bull Run	LAT. °N: 41°04'50"	ELEV. (base lower coal): 1445'	
MINE: Strip mine	LONG. °W: 78°23'58"	TWP.: Goshen	
PERMIT: 1164-3	GEOLOGIST: Hempel	15' QUADRANGLE: Clearfield	JOINTING: Coal cleat: N70E, vert.; N78E, vert.; N80E, vert.;
SAMPLING METHOD: Channel	DATE: Summer 1975	7 1/2' QUADRANGLE: Clearfield	N3E, vert.; N4W, vert.; N3W, vert.
REPORTED COAL NAMES: Upper Kittanning			WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Cover																									
5.0+	Siltstone		S	Md gy																						Plant fragments abundant.
2.8	Coal		S	Bk	B			X		X		X	B	10.9	24.1	53.3	11.7	4.1	60.4	1.0	22.1	0.7	9950	0	2910+	
														4.0	21.3	58.6	16.1	4.6	70.0	1.1	7.5	0.7	12310	9	2910+	Sample #410451/782356.
0.3+	Claystone		S	Dk gy																						Rootworked.

SITE/STATION NO. 84-10	COUNTY: Clearfield		COAL SAMPLE NO(S).: 410612/781807/1, 410612/781807/3, 410614/781808/1, 410614/781808/3
COMPANY: K & G Coal	LAT. °N: 41°06'12"	ELEV. (base lower coal): 1510' (U.F. coal)	
MINE: Strip mine	LONG. °W: 78°18'07"	TWP.: Girard	
PERMIT:	GEOLOGIST: Hempel	15' QUADRANGLE: Clearfield	JOINTING:
SAMPLING METHOD: Channel	DATE: Summer 1975	7 1/2' QUADRANGLE: Lecontes Mills	
REPORTED COAL NAMES: Lower Freeport and Upper Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5.0±	Sandstone		S	Lt gy																						
15.0	Siltstone		S	Md gy																						Abundant plant fragments.
2.9	Coal (Upper Freeport)		S	Bk	B			X					B	2.8	25.3	58.3	13.6	4.6	73.3	1.3	6.7	0.5	12800	8	2910+	Thin binder 0.3' from base.
														3.1	25.6	66.4	4.9	4.9	81.0	1.4	7.3	0.5	14210	9	2910+	Sample #410614/781808/3.
0.3+	Claystone			Gy																						Rootworked.
	Cover																									
10.0+	Siltstone			Ol																						Inaccessible.
0.9	Coal (Lower Freeport rider)			Bk																						Inaccessible.
10.0±	Siltstone			Md to dk gy																						Crossbedded. Several 0.1' coal lenses.
4.1	Coal (Lower Freeport)			Bk	B			X					B	4.2	24.9	62.3	8.6	4.9	76.8	1.4	5.3	3.0	13480	9	2160	Pyrite lenses.
														4.7	24.2	62.1	9.0	5.0	75.8	1.3	6.3	2.6	13360	9	2180	Sample #410614/781808/1.
0.3+	Claystone			Md gy																						Rootworked.

SITE/STATION NO. 84-11		COUNTY Clearfield		COAL SAMPLE NO(S).: 410512/781715	
COMPANY: Manor Mining & Contracting		LAT °N: 41°05'12"	ELEV. (base lower coal):		
MINE: Manor #44 Deep Mine		LONG. °W: 78°17'15"	TWP.: Girard		
PERMIT:		GEOLOGIST: Glover & Inners	15' QUADRANGLE: Clearfield	JOINTING:	
SAMPLING METHOD: Channel		DATE: 5-14-75	7 1/2' QUADRANGLE: Lecontes Mills		
REPORTED COAL NAMES: Lower Kittanning no. 3				WEATHERING: Fresh	

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Bonded(B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Clay shale																									
3.2	Coal			Bk	B		X	X			X	X	D	2.7	33.5	47.5	16.3	4.9	65.7	1.2	8.2	3.7	11830	5	2080	Pyrite lenses and streaks abundant from 0.9-1.0' above base. Scattered bony layers <½" thick. For trace element analysis, see sample #410512/731715.
	Clay shale?																									

SITE/STATION NO. 84-12	COUNTY: Clearfield		COAL SAMPLE NO(S).: 410514/781709
COMPANY: Manor Mining & Contracting	LAT. °N: 41°05'14"	ELEV. (base lower coal):	
MINE: Manor #44 Deep Mine	LONG. °W: 78°17'09"	TWP.: Girard	
PERMIT:	GEOLOGIST: Glover & Inners	15' QUADRANGLE: Clearfield	JOINTING:
SAMPLING METHOD: Channel	DATE: 5-14-75	7 1/2' QUADRANGLE: Lecontes Mills	
REPORTED COAL NAMES: Lower Kittanning no. 3			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS										FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL									PROXIMATE (%)				ULTIMATE (%)					BRITISH THERMAL UNITS / POUND			
					Bonded (B), Non-Bonded (N), or Mixed (M)	VITRAIN							Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR				
						ABUNDANCE				THICKNESS																
						>60%	30-60%	15-30%	<15%	>5 mm	2-5mm	1/2-2mm														
	Clay shale?																									
3.1	Coal			Bk	B			X	X			X	D	1.7	40.2	44.4	13.7	5.1	69.0	1.0	4.6	6.6	12210	5	2050	Olive-brown clay layer (½" thick) 0.1' below top. For trace element analysis, see sample #410514/781709.
	Clay shale?																									

SITE/STATION NO. 85-11 (page 1)	COUNTY. Clearfield		COAL SAMPLE NO(S).: 404506/782307/1, 2, 4, 404502/782301/1, 2, 3, 4
COMPANY: Anderson Creek Coal & Clay Co.	LAT. °N: 40°45'06"	ELEV. (base lower coal): 1710'	
MINE: Strip mine	LONG. °W: 78°23'07"	TWP.: Gulich	
PERMIT: 547-3	GEOLOGIST: Hempel	15' QUADRANGLE: Houtzdale	JOINTING: Coal cleat (Brookville): N10W; N15W; N15W (face):
SAMPLING METHOD: Channel	DATE: 6-23-75	7 1/2' QUADRANGLE: Ramey	N85E; N81E; N85E (butt). Strike and dip on coal: N20W, 7SW.
REPORTED COAL NAMES: Brookville and Lower Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Cover																									
5+	Sandstone			Md ol gy																						Crossbedded. Plant fragments rare.
6.0	Coal (Lower Kittanning)		S	Bk	B		X						MD	4.4	22.6	64.1	8.9	4.8	75.1	1.3	9.0	0.9	13060	1½	2680	For trace element analysis, see sample #404502/782301/4.
														1.8	39.6	52.3	6.3	5.4	75.4	1.4	7.2	4.3	13800	6	2240	For trace element analysis, see sample #404506/782307/4.
0.5	Clay shale		S	Dk gy																						Rootworked. Plant fragments abundant.
1.2	Coal (Lower Kittanning)		S	Bk	B				X			X	D	1.7	23.2	52.7	22.4	4.2	63.9	1.0	4.1	4.4	11390	7	2460	For trace element analysis, see sample #404502/782301 3.
12.0	Silty sandstone		S	Lt gy																						Rare plant fragments.
3.0±	Sandy siltstone		G	Ol gy																						Plant fragments abundant.
3.1	Coal (Lower Kittanning)		S	Bk									MB	1.9	24.4	66.1	7.6	4.9	79.4	1.4	5.9	0.8	13930	9	2910+	Rare pyrite. For trace element analysis, see sample #404506/782307 2.
														0.7	24.0	62.7	12.6	4.6	75.9	0.7	5.1	1.1	13410	9	2910+	For trace element analysis, see sample #404502/782301 2.
0.3+	Claystone		S	Dk gy																						
15.7±	Cover																									
28.0	Claystone			Md gy																						
1.0	Bony coal		S	Bk	B				X			X	D													

SITE/STATION NO. 85-11 (page 2)
COMPANY:
MINE:
PERMIT:
SAMPLING METHOD:
REPORTED COAL NAMES:
COUNTY:
LAT. °N:
LONG. °W:
GEOLOGIST:
DATE:
ELEV. (base lower coal):
TWP.:
15' QUADRANGLE:
7 1/2' QUADRANGLE:
COAL SAMPLE NO(S).:
JOINTING:
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
4.5	Coal (Brookville-Clarion)		S	Bk	B		X				X		MB	2.7	21.9	56.7	18.7	4.5	68.0	1.0	5.7	2.1	11850	8½	2670	Pyrite lenses common. Rolls steeply to west. For trace element analysis, see sample #404506/782307/1.
														1.0	22.0	60.7	16.3	4.2	69.0	1.0	2.7	6.8	12390	8½	2080	For trace element analysis, see sample #404502/782301/1.
0.3+	Claystone		S	Lt gy																						Rootworked. Plant fragments abundant.

SITE/STATION NO. 85-12	COUNTY: Clearfield		COAL SAMPLE NO(S).: 405735/782503, 405738/782504
COMPANY: Simca Mining	LAT. °N: 40°57'35"	ELEV. (base lower coal): 1460'	
MINE: Strip mine	LONG. °W: 78°25'03"	TWP.: Lawrence	
PERMIT: 529-8	GEOLOGIST: Hempel	15' QUADRANGLE: Houtzdale	JOINTING: Coal cleat: N50W, vert.; N55W, vert.; N48W, vert. (face); N-S, vert.; N11E, vert. (butt). Strike and dip of coal: N9E, 5SE.
SAMPLING METHOD: Channel sample	DATE: Summer 1975	7 1/2' QUADRANGLE: Glen Richey	
REPORTED COAL NAMES: Lower Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S: Sharp, G: Gradational, U: Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10.0+	Silt shale			Md gy																						
0.5	Coal			Bk																						
4.0±	Sandy siltstone			Lt bn gy																						
0.1±	Coal			Bk																						
10.0+	Siltstone			Md gy																						
0.5	Coal			Bk	B				X				MD													Not continuous.
0.2	Carbonaceous clay shale			Bk																						Plant fragments. Rootworked.
8.0	Clay shale			Dk gy																						Plant fragments common. Siderite nodules present.
2.8	Coal			Bk	B			X				X	MB	0.7	21.2	62.0	16.1	4.3	72.3	1.1	2.9	3.3	12740	9	2430	Hard bone in spots. Rolls.[1]
														0.7	20.3	62.6	16.4	4.1	71.6	1.0	1.4	5.5	12590	9	2070	[2]
0.3+	Clay shale			Dk gy																						Rootworked.

[1] For trace element analysis, see sample =405735/782503.

[2] For trace element analysis, see sample =405738/782504.

SITE/STATION NO. 94-31	COUNTY: Clearfield	COAL SAMPLE NO(S).: 410006/780410
COMPANY: Earl M. Brown Co.	LAT °N: 41°00'06" ELEV. (base lower coal): 1560'	
MINE: Strip mine	LONG. °W: 78°04'10" TWP.: Cooper	
PERMIT:	GEOLOGIST: Hempel 15' QUADRANGLE: Karthaus	JOINTING:
SAMPLING METHOD: Channel	DATE: Summer 1975 7 1/2' QUADRANGLE: Karthaus	
REPORTED COAL NAMES: Lower Kittanning		WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Cover																									
25.0	Sandstone		S	Lt gy																						Massive.
0.5	Carbonaceous shale		S	Bk																						Plant fragments abundant.
2.2	Coal		S	Bk	B		X			X	X		MB	6.9	23.2	62.7	7.2	5.1	75.2	1.2	9.2	2.1	13190	8½	2130	Rolls. Pyrite lenses.
0.3	Claystone			Lt bn																						Soft.

SITE/STATION NO. 94-32	COUNTY: Clearfield		COAL SAMPLE NO(S).: 410524/781327/2A, 410524/781327/3B, 410524/781327/5
COMPANY: Kristianson & Johnson Coal Co.	LAT. °N: 41°05'24"	ELEV. (base lower coal): 1465'	
MINE: Strip mine	LONG. °W: 78°13'27"	TWP.: Covington	
PERMIT: 56-28	GEOLOGIST: Hempel	15' QUADRANGLE: Karthaus	JOINTING: N65W, vert. (sandstone). Coal cleat (Lower Kittanning): N5E, vert. (face); N75W, vert. (butt).
SAMPLING METHOD: Channel	DATE: Summer 1975	7 1/2' QUADRANGLE: Frenchville	
REPORTED COAL NAMES: Lower Kittanning			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.5±	Coal																									Not accessible.
1.5±	Shale?																									Not accessible.
7.0	Sand-silt laminite			Lt ol gy Md lt gy																						Plant fragments abundant along bedding planes.
5.0	Silty clay shale			Dk gy																						Siderite nodules.
1.2	Coal			Bk	B				X			X	MB	3.6	25.8	59.8	10.8	4.9	74.5	1.1	5.8	2.9	13220	9	2300	Thin pyrite lenses.
	Silt shale			Dk gy																						Rootworked.
	Cover																									
2.5	Sandstone			Lt gy																						Plant fragments abundant.
4.4	Coal	1.9		Bk	B			X			X	X	M	5.7	25.3	57.1	11.9	4.9	70.7	1.2	7.7	3.6	12620	9	2090	
	Silty claystone	0.5	S	Md dk gy																						Rootworked.
	Coal (Lower Kittanning)	2.0	S	Bk	B		X	X					B	0.9	22.6	52.2	24.3	4.0	63.6	1.0	5.6	1.5	11220	7½	2910+	Bone at top 0.2'. Pyrite lenses.
	Claystone		S	Dk gy																						Rootworked.

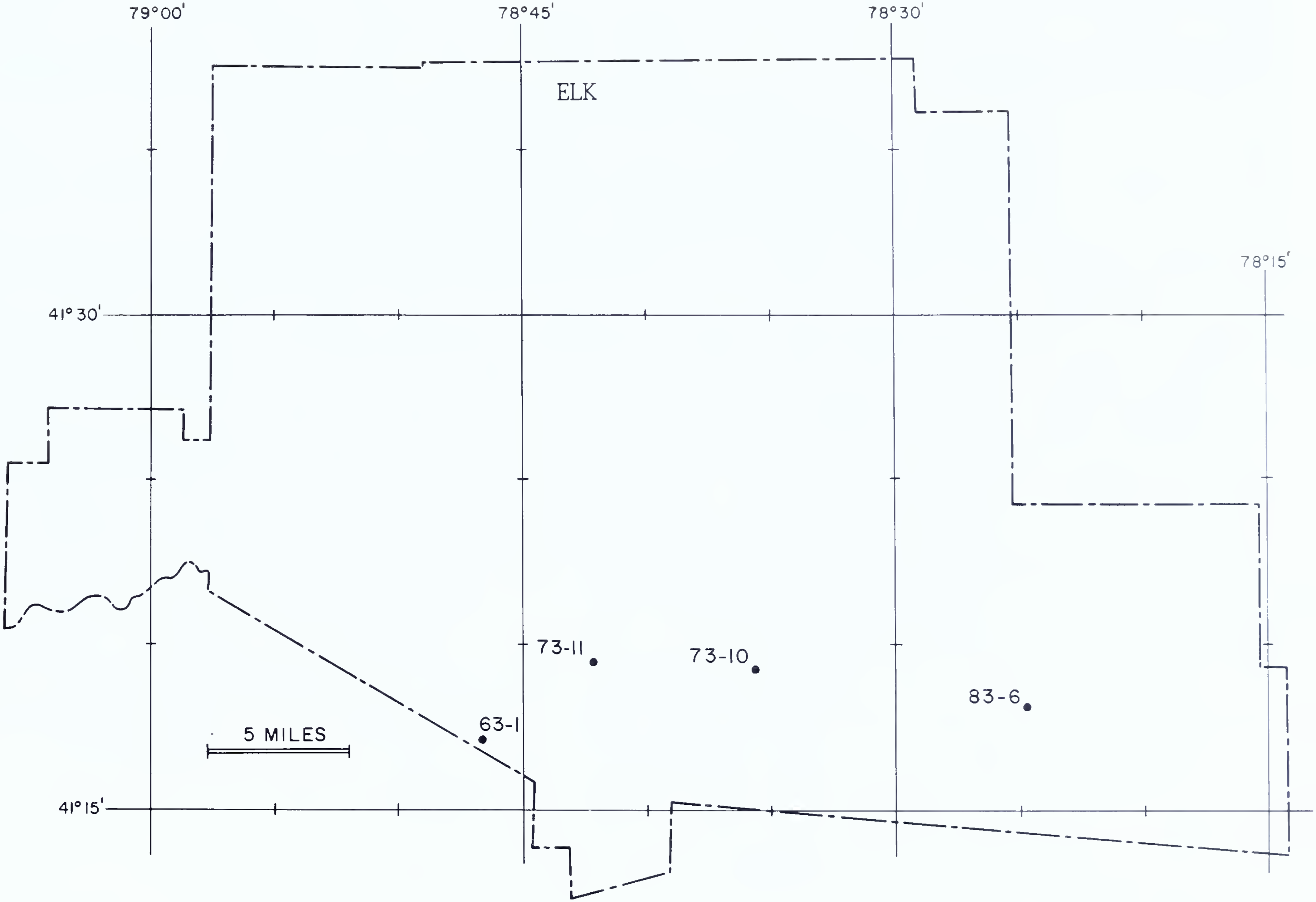
SITE/STATION NO. 94-33
COMPANY: John Teeter Coal Co.
MINE: Strip mine
PERMIT:
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Middle Kittanning and Upper Kittanning?

COUNTY: Clearfield
LAT. °N: 41°08'56"
LONG. °W: 78°06'40"
GEOLOGIST: Hempel
DATE: Summer 1975

ELEV. (base lower coal): 1407'
TWP.: Karthaus
15' QUADRANGLE: Karthaus
7 1/2' QUADRANGLE: Pottersdale

COAL SAMPLE NO(S).: 410856/780640/2, 410856/780640/4, 410854/780645/2
JOINTING: Coal cleat (Middle Kittanning): N75W, vert. (face); N2W, vert. (butt).
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Carain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5+	Sandstone			Lt gy																						Crossbedded.
12.0	Siltstone			Ol gy																						Carbonaceous plant fragments abundant.
3.1	Coal			Bk	B		X				X		B	3.8	23.6	62.7	9.9	4.9	76.6	1.5	6.4	0.7	13420	9	2880	Abandoned deep mine.
2.0	Cover																									
5.0	Sandstone			Lt ol gy																						Crossbedded. Carbonaceous plant fossils abundant.
3.1	Coal (Middle Kittanning)			Bk	B		X					X	MB	0.9	25.7	66.7	6.7	4.9	81.3	1.4	4.1	1.6	14340	9	2910+	
														0.9	22.9	59.6	16.6	4.3	71.8	1.2	3.5	2.6	12670	8½	2430	Sample #410854/780645/2.
0.3	Claystone			Md gy																						Rootworked. Pyrite blebs.


79°00'
78°45'
78°30'
78°15'
ELK
41° 30'
41° 15'
73-11
73-10
83-6
63-1
5 MILES

SITE/STATION NO. 63-1 (page 1)	COUNTY: Elk		COAL SAMPLE NO(S).: 411708/784629/1, 411708/784629/2, 411706/784628
COMPANY: P & N Coal Co.	LAT. °N: 41°17'08"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 78°46'29"	TWP.: Horton	JOINTING: Coal cleat on Middle Kittanning: N35W, vert.; N38W, vert. (face); N55E, vert.; N60E, vert. (butt). Coal cleat on Lower Kittanning: N40W, vert. (face); N50E, vert.; N52E, vert. (butt). Strike and dip on coal: N41W, 3NE.
PERMIT: 32-74	GEOLOGIST: Hempel	15' QUADRANGLE: Hallton	
SAMPLING METHOD: Channel	DATE: 6-3-75	7 1/2' QUADRANGLE: Carman	
REPORTED COAL NAMES: Middle Kittanning, Lower Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Sandstone		U	Lt ol gy																						Fine to medium grained. Apparent trend of channel crossbedding--N10E.
0.9	Coal		S	Bk	B			X			X	X	MD													Coal thickens laterally. Top appears to be cut out by overlying sandstone.
1.5	Claystone		S	Lt gy																						Rootworked.
5.0	Limestone		G	Dk gy																						Rootworked. Iron stained.
6.0	Silty claystone		G	Gn gy																						Silt content increases upward.
1.0	Sandstone		G	Yel bn gy																						Fine to medium grained.
20.0	Silty claystone		G	Gn gy																						
5.0±	Clay-silt laminite		S	Md gy Bn																						Plant fragments present.
0.2	Clay shale		S	Md gy																						
2.5	Coal (Middle Kittanning)		S	Bk	B		X				X		M	1.4	34.8	53.3	10.5	5.2	73.4	1.6	7.4	1.9	13220		2170	For trace element analysis, see sample #411708/784629/2.
														1.0	36.6	52.8	9.6	5.2	74.8	1.6	6.8	2.0	13560		2280	For trace element analysis, see sample #411706/784628.
	Claystone			Dk gy																						Rootworked.
	Cover																									

SITE/STATION NO. 63-1 (page 2)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: ELEV. (base lower coal):	
MINE:	LONG. °W: TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
15±	Calcareous sand-silt laminite			Md dk gy Lt gy																						Crossbedded. Inaccessible.
3.8	Coal (Lower Kittanning)		S	Bk	B	X	X				X		B	1.0	37.8	53.1	8.1	5.4	75.4	1.6	6.4	3.1	13650		2170	Coal rolls approximately 20' within ~75' lateral distance and thickens at bottom of roll. For trace element analysis, see sample #411708/784629/1.
	Clay shale		S	Dk gy																						Subfissile. Rare plant fragments.

SITE/STATION NO. 73-10
COMPANY: Tamburlin Bros. Coal Co.
MINE: Strip mine
PERMIT:
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Lower Kittanning
COUNTY: Elk
LAT. °N: 41°19'14"
LONG. °W: 78°35'46"
GEOLOGIST: Hempel
DATE: Summer 1975
ELEV. (base lower coal): 1923'
TWP.: Fox
15' QUADRANGLE: Ridgway
7 1/2' QUADRANGLE: Kersey
COAL SAMPLE NO(S).: 411914/783546, 411912/783546
JOINTING: Coal cleat: N65W, vert. (face); N23E, vert. (butt).
WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUN-DANCE				THICK-NESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
~1.0	Carbonaceous clay shale																									Not accessible.
15.0±	Silt shale		S	Dk gy																						Siderite nodules. Fissile. Weathered.
15.0±	Siltstone		S	Ol gy																						Siderite nodules.
1.4	Silt shale		S	Dk gy																						Plant fragments abundant.
3.1	Coal		S	Bk	B			X					B	2.3	32.3	45.9	19.5	4.6	64.6	1.1	7.8	2.4	11630	8½	2520	Bony at top. Thin bony partings. Yellow sulfur bloom. Pyrite lenses (½-20 mm).
														2.3	30.3	45.2	22.2	4.5	62.5	2.0	5.8	3.0	11190	8½	2410	Sample #411912/783546.
	Claystone		S	Md gy																						Rootworked.

SITE/STATION NO. 73-11 (page 1)	COUNTY: Elk		COAL SAMPLE NO(S).: 411935/784205/1, 411935/784205/2, 411937/784204
COMPANY: Smith & Rogos	LAT. °N: 41°19'35"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 78°42'05"	TWP.: Horton	JOINTING: Coal cleat: (Lower coal) N51W, vert.; N64W,
PERMIT: 139-7	GEOLOGIST: Hempel & Skema	15' QUADRANGLE: Ridgway	vert.; N66W, vert. (face); N32E, vert.; N41E, vert., N36E,
SAMPLING METHOD: Channel	DATE: 6-3-75	7 1/2' QUADRANGLE: Brandy Camp	vert. (butt). Strike and dip on coal: N65E, 7NW.
REPORTED COAL NAMES: Upper Kittanning			WEATHERING: Fresh

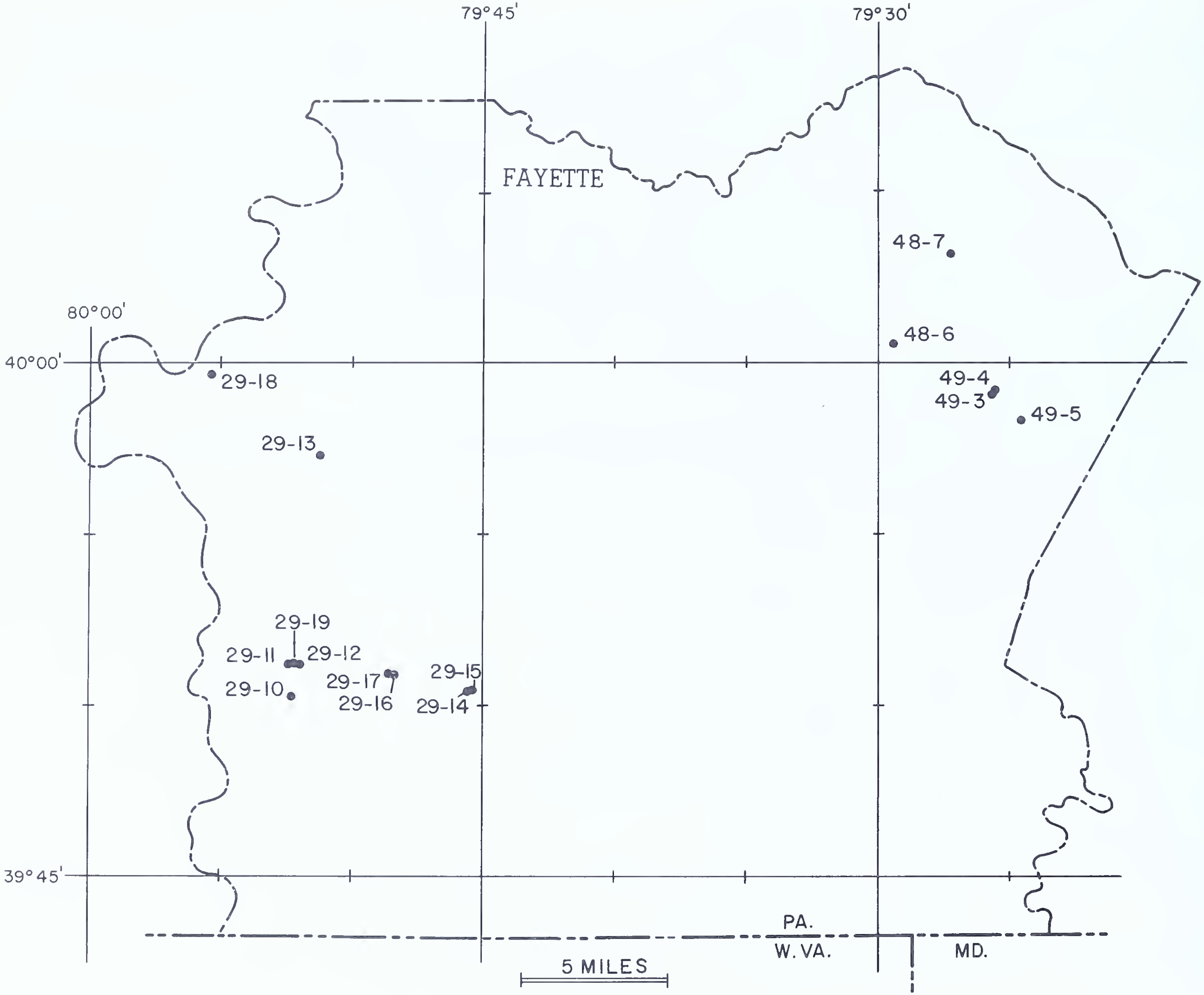
STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
8±	Sand-silt laminite			Pale yel bn Ol gy																						Few plant fragments. Fine- to medium-grained sand. Sand coarsens upward.
4.0	Cover																									
15.0	Sand-silt laminite			Pale yel bn Ol gy																						Few plant fragments. Very fine to fine-grained sand.
1.0	Carbonaceous clay shale		S	Gy bk																						
1.6	Silty clay shale		S	Dk gy																						Plant fragments common.
1.3	Coal		S	Bk	B			X				X	MB	5.0	33.2	53.6	8.2	4.9	69.0	1.3	16.0	0.6	11790	1/2	2010	For trace element analysis, see sample #411935/784205/2.
4.2	Sand-silt laminite		S	Md gy Dk gy																						Rootworked. Plant fragments common. Very fine to fine grained.
6.0	Sand-silt laminite			Md gy Dk gy																						Plant fragments common. Very clayey at base. Sandier at top. Very fine grained sand.
5.2	Silty claystone			Gy bk																						Plant fragments rare. Silt content increases upward.
2.0	Claystone			Md gy																						Rootworked.
0.5	Bone coal			Gy bk																						

SITE/STATION NO. 73-11 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)										
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.4	Coal			Bk	B			X	X		X	X	MB	2.9	30.7	56.5	9.9	4.9	71.8	1.1	11.6	0.6	12550		2520	For trace element analysis, see sample #411935/784205/1.
														1.6	30.1	56.1	12.2	4.8	71.3	1.4	9.8	0.5	12650		2910+	For trace element analysis, see sample #411937/784204.
	Claystone			Lt gy																						Rootworked.

SITE/STATION NO. 83-6	COUNTY: Elk		COAL SAMPLE NO(S).: 411802/782440, 411801/782438
COMPANY: P & N Coal Co.	LAT. °N: 41°18'02"	ELEV. (base lower coal): 1640'	
MINE: Strip mine	LONG. °W: 78°24'40"	TWP.: Benezette	
PERMIT: 32-68	GEOLOGIST: Hempel	15' QUADRANGLE: Benezette	JOINTING: Siltstone: E-W, vert. Coal cleat: N70W, vert.;
SAMPLING METHOD: Channel	DATE: Summer 1975	7 1/2' QUADRANGLE: Weedville	N60W, vert. (face); N21E, vert.; N11E, vert. (butt).
REPORTED COAL NAMES: Lower Kittanning			WEATHERING: Fresh | Attitude of coal bed: horizontal.

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Cover																									
25.0	Siltstone			Md gy																						Siderite nodules. Some crossbedding. Plant fragments abundant.
			S																							
1.9	Coal			Bk	B			X				X	B	1.2	27.2	43.0	28.6	4.0	60.7	1.0	4.6	1.1	10780	4	2910+	Very hard.
														1.3	32.6	60.4	5.7	5.3	80.3	1.5	5.4	1.8	14320	8	2150	Sample =411801/782438.
			S																							
	Clay shale			Dk gy																						Rootworked. Coalified plant fragments abundant.


79°45'
79°30'
FAYETTE
48-7
48-6
80°00'
40°00'
29-18
49-4
49-3
49-5
29-13
29-19
29-11
29-12
29-17
29-15
29-10
29-16
29-14
39°45'
PA.
W. VA.
MD.
5 MILES

SITE/STATION NO. 29-10
COMPANY: Filiaggi Coal Co.
MINE: Strip mine
PERMIT: 178-10
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Redstone

COUNTY: Fayette
LAT. °N: 39°50'14"
LONG. °W: 79°52'31"
GEOLOGIST: Gabler
DATE: 7-9-75
ELEV. (base lower coal): 1098'
TWP.: Nicholson
15' QUADRANGLE: Masontown
7 1/2' QUADRANGLE: Masontown

COAL SAMPLE NO(S).: 395014/795231/2, 395014/795231 4
JOINTING: Coal cleat: N70W, 87SW; N20E, vert. Strike and dip of coal: N70E, 5NW.
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3+	Overburden			Md bn																						
1.0	Limestone		S	Bn gy																						
~4	Calcareous claystone		S	Bn gy																						
~14	Clay shale		G	Md gy																						
~12	Claystone		G	Md dk gy to dk gy																						
2.6	Coal	1.6	S	Bk	B				X			X	B	1.8	34.2	59.1	4.9	5.2	79.6	1.6	7.7	1.0	14210	9	2350	
	Claystone	0.1	S	Gy bk to dk gy																						
	Coal	0.9	S	Bk	B				X			X	MB	2.0	28.8	52.4	16.8	4.5	68.8	1.3	7.2	1.4	12140	8	2260	Calcite-encrusted fractures.
0.1	Claystone		S	Dk gy to md dk gy																						

SITE/STATION NO.	29-11	COUNTY:	Fayette	COAL SAMPLE NO(S).:	395109/795232/2, 395109/795232/4, 395109/795232/6
COMPANY:	Pontorero & Sons Coal Co.	LAT. °N: 39°51'09"	ELEV. (base lower coal): 1099'		
MINE:	Strip mine	LONG. °W: 79°52'32"	TWP.: German		
PERMIT:	237-10	GEOLOGIST: Gabler	15' QUADRANGLE: Masontown	JOINTING:	Coal cleat: N5W, 80NE; N15E, 84SE.
SAMPLING METHOD:	Channel	DATE: 6-24-75	7 1/2' QUADRANGLE: Masontown		
REPORTED COAL NAMES:	Redstone			WEATHERING:	Weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
~16.0	Sandstone			Lt gy to lt bn																						Micaceous.
5.4	Coal	0.9		Bk	B				X			X	MD	11.5	30.1	37.3	21.1	4.5	51.5	1.0	20.9	1.0	8690	0	2780	
	Shale	0.1		Bk to gy bk																						Contains vitrain layers <1 mm thick.
	Coal	3.1		Bk	B			X				X	MD	11.8	31.8	48.1	8.3	5.0	61.9	1.3	21.9	1.6	10560	0	2520	1
	Claystone	0.7		Md gy to md dk gy																						
	Coal	0.6		Bk	B		X				X	X	M	6.4	29.1	41.9	22.6	4.6	58.1	1.1	11.8	1.7	10330	2½	2730	Lenticular claystone up to 1" thick in middle of coal bed.[2]
1.5+	Sandy claystone			Md gy to md dk gy																						

[1] For trace element analysis, see sample #395109/795232/4.

[2] For trace element analysis, see sample #395109/795232/2.

SITE/STATION NO. 29-12	COUNTY: Fayette		COAL SAMPLE NO(S).: 395110/795212/3, 395110/795212/5, 395110/795212/7
COMPANY: Pontorero & Sons Coal Co.	LAT. °N: 39°51'10"	ELEV. (base lower coal): 1157'	
MINE: Strip mine	LONG. °W: 79°52'12"	TWP.: German	
PERMIT: 237-10	GEOLOGIST: Gabler & Sholes	15' QUADRANGLE: Masontown	JOINTING: Face cleat: N20W, 86NE.
SAMPLING METHOD: Channel	DATE: 6-24-75	7 1/2' QUADRANGLE: Smithfield	
REPORTED COAL NAMES: Sewickley			WEATHERING: Weathered

STRATIGRAPHIC DATA															COAL ANALYSIS													
					COAL										PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																						
						ABUNDANCE				THICKNESS																		
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS		
6.0+	Cover			Lt bn																								
4.3	Coal	3.4	G	Bk	B				X			X	M	10.1	30.7	52.5	6.7	4.7	63.4	1.3	22.3	1.6	10550	½	2910+	For trace element analysis, see sample #395110/795212/7.		
	Claystone	0.2	S	Gy bk to bk																						Few plant fossils.		
	Coal	0.3	S	Bk	B				X			X	MD	6.2	31.0	53.9	8.9	4.8	65.7	1.4	17.7	1.5	11410	½	2910+	For trace element analysis, see sample #395110/795212/5.		
	Claystone	0.1	S	Bk																								
	Coal	0.3	S	Bk	B	X					X	X	MB	7.0	29.0	46.7	17.3	4.7	60.3	1.1	15.2	1.4	10470	½	2910+	For trace element analysis, see sample #395110/795212/3.		
5.2	Sandy claystone		G	Md gy to md dk gy																								
5.0+	Sandy limestone			Md dk gy to dk gy																								

SITE/STATION NO.: 29-13	COUNTY: Fayette		COAL SAMPLE NO(S).: 395714/795625/2, 395714/795625/4, 395714/795625/6, 395714/795625/8, 395714/795625/10		
COMPANY: Luzerne Coal	LAT. °N: $39^0 57'14''$	ELEV. (base lower coal): 1053'			
MINE: Strip mine	LONG. °W: $79^0 56'25''$	TWP.: Luzerne			
PERMIT: 750-7	GEOLOGIST: Gabler	15' QUADRANGLE: Masontown	JOINTING: Coal cleat: N70W, 86NE; N20E, 85SE. Strike and dip on coal: N70W, 3NE.		
SAMPLING METHOD: Channel	DATE: 7-22-75	7 1/2' QUADRANGLE: Carmichael			
REPORTED COAL NAMES: Waynesburg			WEATHERING: Fresh		

STRATIGRAPHIC DATA					COAL								COAL ANALYSIS												
						VITRAIN							PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS															
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.0+	Overburden																									
	Coal			Bk																						
~15.0	Silty clay shale			Gy																						
~50.0	Sandstone			Gy																						Calcareous.
~5.0	Silty clay shale			Md dk gy to md gy																						
3.2	Coal	0.6	S	Bk	B			X			X	X	M	2.4	28.2	42.7	26.7	4.2	58.5	1.4	7.3	1.9	10420	5½	2570	
	Clay shale	0.15	G	Dk gy to gy bk																						
	Coal	0.3	S	Bk	B				X		X	X	M	1.3	30.9	42.1	25.7	4.4	60.9	1.2	6.5	1.3	10930	2	2910+	Few pyrite lenses. Hard and blocky.
	Clay shale	0.05	S	Gy bk to bk																						
	Coal	0.25	G	Bk	B			X		X	X	X	MB	1.3	31.5	41.0	26.2	4.4	60.0	1.4	6.6	1.4	10780	4½	2910+	Few pyrite lenses. Hard and blocky.
	Clay shale	0.1	G	Dk gy to gy bk																						
	Coal	0.8	S	Bk	B			X		X	X	X	MB	1.5	34.8	50.5	13.2	5.1	71.5	1.8	7.4	1.0	12810	8	2910+	Few pyrite lenses (1 mm x 3 mm).
	Coaly shale	0.05	G	Bk																						
	Coal	0.9	G	Bk	B				X			X	B	2.6	32.1	51.5	13.8	4.9	70.3	1.6	7.6	1.8	12560	8½	2680	Few pyrite lenses (1 mm).
0.1+	Claystone		S	Md dk gy to dk gy																						

SITE/STATION NO. 29-14	COUNTY: Fayette		COAL SAMPLE NO(S).: 395021/704542/2A, 395021/704542/2B
COMPANY: Hibbs & Myers Coal Co.	LAT. °N: 39°50'21"	ELEV. (base lower coal):	
MINE: Hibbs strip mine	LONG. °W: 70°45'42"	TWP.: Georges	
PERMIT: 833-4	GEOLOGIST: Sholes	15' QUADRANGLE: Masontown	JOINTING:
SAMPLING METHOD: Channel	DATE: 6-23-76	7 1/2' QUADRANGLE: Smithfield	
REPORTED COAL NAMES: Redstone			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL										COAL ANALYSIS												
						VITRAIN									PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Soil																									
~12	Clay shale			Md lt gy																						Silty.
2.8	Coal	1.2	S	Bk	B		X					X	MB	1.1	33.6	55.2	10.1	4.9	75.9	1.6	6.0	1.5	13543	8½	2800+	
	Claystone	0.4	S	Gy bk																						
	Coal	1.2	S	Bk	B		X			X	X	X	D	1.3	29.0	60.1	9.6	4.8	76.6	1.5	6.3	1.2	13609	8½	2495	Apparent calcite on cleat.
0.1	Claystone		S	Gy bk																						

SITE/STATION NO. 29-15
COMPANY: Carbonara Coal
MINE: Strip mine
PERMIT: 550-9
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Redstone

COUNTY: Fayette
LAT. °N: 39°50'28"
LONG. °W: 79°45'24"
GEOLOGIST: Sholes
DATE: 6-23-76

ELEV. (base lower coal):
TWP.: Georges
15' QUADRANGLE: Masontown
7 1/2' QUADRANGLE: Smithfield

COAL SAMPLE NO(S).: 395028/794524/2A, 395028/794524/2C, 395028/794524/2E
JOINTING:
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Soil																									
~9	Clay shale		G	Gy bk																						
3.0	Coal	0.2	S	Bk	B		X				X	X	MD	1.4	25.0	51.4	22.2	4.3	62.7	1.3	5.9	3.7	11359	7½	2355	
	Claystone	0.3	G	Gy bk																						
	Coal	1.45	S	Bk	B		X				X	X	D	1.1	34.0	55.0	9.9	5.2	75.8	1.6	5.8	1.7	13574	9	2555	
	Claystone	0.35	S	Bk to gy																						
	Coal	0.7	S	Bk	B	X					X	X	B	1.4	29.0	57.7	11.9	4.8	74.1	1.6	6.5	1.0	13189	9	2800	Claystone dikes give variable thickness.
0.7	Claystone		S	Dk gy																						

SITE/STATION NO. 29-16
COMPANY: Max Noble
MINE: Strip mine
PERMIT:
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Redstone

COUNTY: Fayette
LAT. °N: 39°50'52"
LONG. °W: 79°48'28"
GEOLOGIST: Sholes
DATE: 6-23-76

ELEV. (base lower coal):
TWP.: Georges
15' QUADRANGLE: Masontown
7 1/2' QUADRANGLE: Smithfield

COAL SAMPLE NO(S).: 395052/794828
JOINTING: Coal cleat: N62W, 84S; N65W, 86S; N25E, vert.; N68W, 86N; N15E, vert.
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN ABUNDANCE				VITRAIN THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Clay shale			Md lt gy																						
2.5	Coal		S	Bk	B		X			X	X		MB	1.2	30.7	60.3	7.8	5.1	77.1	1.6	6.2	2.3	13798	8½	2250	
0.1+	Claystone		S	Md gy																						

SITE/STATION NO. 29-17	COUNTY: Fayette	COAL SAMPLE NO(S).: 395056/794830/2A, 395056/794830/2C, 395056/794830/2E
COMPANY: Max Noble	LAT. °N: 39°50'56" ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 79°48'30" TWP.: Georges	
PERMIT:	GEOLOGIST: Sholes 15' QUADRANGLE: Masontown	JOINTING:
SAMPLING METHOD: Channel	DATE: 6-23-76 7 1/2' QUADRANGLE: Smithfield	
REPORTED COAL NAMES: Sewickley		WEATHERING: Weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Soil																									
~8	Shale		G	Md gy																						Weathered.
6.0	Sandstone		S	Lt gy																						Medium to coarse grained.
~8	Shale			Md gy																						Contact with coal covered. Silty.
4.85	Coal	1.6	S	Bk	B		X				X	X	B	5.4	29.4	59.8	5.4	5.0	71.3	1.5	14.9	1.9	12499	1	2355	
	Clay shale	0.1	S	Dk gy																						
	Coal	2.5	S	Bk	B		X					X	MB	5.5	29.6	54.1	10.8	5.1	68.3	1.4	12.4	2.1	12167	4	2615	
	Claystone	0.25	S	Md gy																						Some plant fossils.
	Coal	0.4	S	Bk	B		X					X	M	3.2	29.2	47.6	20.0	4.7	62.0	1.1	6.8	5.3	11343	8½	2715	
0.1+	Claystone			Md gy																						

SITE/STATION NO.	29-18	COUNTY:	Fayette	COAL SAMPLE NO(S).:	395936/795530/1, 395936/795530/3, 395936/795530/5
COMPANY:	Pennsylvania Mineral Co.	LAT. °N: 39°59'36"	ELEV. (base lower coal): 1051'		
MINE:	Strip mine	LONG. °W: 79°55'30"	TWP.: Redstone		
PERMIT:	653-4	GEOLOGIST: Gabler	15' QUADRANGLE: Masontown	JOINTING:	Coal cleat: N70W, vert.; N20E, vert. Strike and dip of coal: N80E, 2SE.
SAMPLING METHOD:	Channel	DATE: 6-16-75	7 1/2' QUADRANGLE: Carmichaels		
REPORTED COAL NAMES:	Waynesburg			WEATHERING:	Fresh

STRATIGRAPHIC DATA: THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Bonded (B), Non-Bonded (N), or Mixed (M)	VITRAIN ABUNDANCE >60%	VITRAIN ABUNDANCE 30-60%	VITRAIN ABUNDANCE 15-30%	VITRAIN ABUNDANCE <15%	VITRAIN THICKNESS >5mm	VITRAIN THICKNESS 2-5mm	VITRAIN THICKNESS 1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	COAL ANALYSIS: PROXIMATE (%) MOISTURE	PROXIMATE (%) VOLATILE MATTER	PROXIMATE (%) FIXED CARBON	PROXIMATE (%) ASH	ULTIMATE (%) HYDROGEN	ULTIMATE (%) CARBON	ULTIMATE (%) NITROGEN	ULTIMATE (%) OXYGEN	ULTIMATE (%) SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3-5	Overburden			Lt bn																						
1	Limestone		G	Lt bn																						
1	Calcareous clay shale		S	Md gy																						
1	Limestone		S	Lt bn																						
~8	Calcareous clay shale		S	Md gy																						
~5	Sandstone		G	Lt gy																						
1.4	Clay shale		G	Dk gy																						
4.7	Coal	0.75	S	Bk	B				X			X	MD													
	Coal	0.3	S	Bk	B			X				X	MD	1.5	29.4	42.5	26.6	4.0	58.5	1.4	6.7	2.8	10500	6	2410	For trace element analysis, see sample #395936/795530/5.
	Carbonaceous clay shale	0.25	S	Gy bk to dk gy																						
	Coal	2.0	S	Bk	B		X					X	M	1.3	37.4	44.8	16.5	4.8	68.5	1.6	6.6	2.0	12260	8	2380	Pyrite lenses rare. For trace element analysis, see sample #395936/795530/3.
	Claystone	0.5	S	Dk gy to md dk gy																						Plant fossils rare.
	Coal	0.9	S	Bk	B	X						X	M	1.4	35.6	49.9	13.1	5.0	70.3	1.5	5.4	4.7	12670	8	2080	Pyrite lenses up to 2 mm x 10 cm. For trace element analysis, see sample #395936/795530/1.

SITE/STATION NO. 29-19
COMPANY: Pontorero & Sons
MINE: Strip mine
PERMIT: 237-10
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Sewickley
COUNTY: Fayette
LAT. °N: 39°51'09"
LONG. °W: 79°52'15"
GEOLOGIST: Gabler & Sholes
DATE: 6-24-75
ELEV. (base lower coal):
TWP.: German
15' QUADRANGLE: Masontown
7 1/2' QUADRANGLE: Smithfield
COAL SAMPLE NO(S).: 395109/795215
JOINTING:
WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5.0+	Overburden			Lt bn																						
15.0	Sandstone			Lt gy bn																						
4.1	Bone coal	0.8		Bk																						
	Coal	3.3		Bk	B	X					X	X	M	5.6	33.7	51.4	9.3	5.6	70.4	1.4	11.5	1.8	12570	8½	2910+	
5.0	Claystone			Md gy to md dk gy																						
10.0+	Sandy limestone			Dk gy to md dk gy																						

SITE/STATION NO.	48-6	COUNTY:	Fayette	COAL SAMPLE NO(S).:	400036/792921
COMPANY:	Henry Coal	LAT. °N: 40°00'36"	ELEV. (base lower coal): 1892'		
MINE:	Strip mine	LONG. °W: 79°29'21"	TWP.: Springfield		
PERMIT:	239-1	GEOLOGIST: Gabler	15' QUADRANGLE: Donegal	JOINTING:	Coal cleat: N70W, vert.; N20E, 88SE. Strike and dip of coal: N5E, 5SE.
SAMPLING METHOD:	Channel	DATE: 7-15-75	7 1/2' QUADRANGLE: Donegal		
REPORTED COAL NAMES:	Miller "B"			WEATHERING:	Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2+	Backfill		G	Lt bn																						
2	Claystone		G	Md dk gy to dk gy																						
3	Clay shale		S	Md dk gy to dk gy																						
3.2	Coal	0.7	S	Bk	B			X		X	X	X	B	0.9	26.7	50.8	21.6	4.3	64.1	0.9	2.8	6.3	11680	8½	2140	Peacock luster.
	Claystone	0.4	S	Dk gy to gy bk																						
	Coal	2.1	S	Bk	B			X			X	X	B	1.9	27.1	55.7	15.3	4.6	70.8	1.1	2.9	5.3	12530	7½	2140	Few pyrite lenses (4 mm x 10 mm).
0.1	Claystone			Dk gy to gy bk																						Few pyrite lenses (2 mm x 5 mm).

SITE/STATION NO. 48-7
COMPANY: Purco Coal
MINE: Strip mine
PERMIT: 413-11
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Lower Freeport

COUNTY: Fayette
LAT. °N: 40°03'07"
LONG. °W: 79°27'03"
GEOLOGIST: Gabler
DATE: 6-20-75

ELEV. (base lower coal): 1696'
TWP.: Saltlick
15' QUADRANGLE: Donegal
7 1/2' QUADRANGLE: Donegal

COAL SAMPLE NO(S).: 400307/792703/2, 400310/792703/2

JOINTING: Coal cleat: N70W, 88NE; N20E, vert. Strike and dip on underclay: N80W, 3SW.
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S= Sharp, G= Gradational, U= Uncon.)	COLOR	Banded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
8.0+	Overburden			Lt bn																						
22.0	Clay shale		G	Md gy to md dk gy																						
3.8	Coal		S	Bk	B		X				X	X	MB	2.6	27.9	62.7	6.8	5.0	79.4	1.4	5.4	2.0	14050	8½	2250	1
					B		X			X	X	X	MB	2.4	28.3	61.2	8.1	4.9	78.3	1.3	4.5	2.9	13880	8	2250	2
0.1+	Claystone		S	Md dk gy to dk gy																						Pyrite lenses (1 mm x 10 mm). Few fossil leaves.

[1] For trace element analysis, see sample #400307/792703/2.

[2] For trace element analysis, see sample #400310/792703/2.

SITE/STATION NO. 49-3	COUNTY: Fayette		COAL SAMPLE NO(S).: 395902/792539/2, 395902/792539 4,
COMPANY: Marsolino Coal & Coke	LAT. °N: 39°59'02"	ELEV. (base lower coal): 1439'	395902/792539/6, 395902/792539 8
MINE: Strip mine	LONG. °W: 79°25'39"	TWP.: Springfield	
PERMIT: 71-25	GEOLOGIST: Gabler	15' QUADRANGLE: Confluence	JOINTING: Coal cleat: N75W, 86NE; N15E, vert. Strike and
SAMPLING METHOD: Channel	DATE: 7-15-75	7 1/2' QUADRANGLE: Mill Run	dip of underclay: N45E, 3SE.
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
~8.0+	Overburden			Lt bn																						
~20.0	Sandstone			Bn gy																						
~20.0	Sandstone		G	Gy																						
3.15	Coal	1.5	S	Bk	B			X			X	X	M	1.6	29.2	59.3	9.9	4.8	77.1	1.4	4.3	2.5	13710	8	2200	
	Clay shale	0.1	S	Gy bk to bk																						
	Coal	0.5	S	Bk	B			X		X	X	X	M	3.2	25.4	61.8	9.6	4.9	76.3	1.3	5.2	2.7	13420	9	2460	
	Pyritic clay shale	0.1	S	Bk																						
	Coal	0.2	S	Bk	B			X				X	M	2.2	24.7	62.8	10.3	4.3	76.1	1.5	4.1	3.7	13460	8½	2200	Few pyrite lenses (<1 mm x 2 mm).
	Pyritic clay shale	0.05	S	Bk																						
	Coal	0.7	S	Bk	B			X				X	M	1.7	28.6	61.7	8.0	5.0	79.4	1.5	4.2	1.9	14020	8	2520	Few pyrite lenses (1 mm x 3 mm).
0.1+	Claystone		S	Bn bk																						

SITE/STATION NO. 49-4	COUNTY: Fayette		COAL SAMPLE NO(S).: 395908/792535/2, 395908/792535/4
COMPANY: Marsolino Coal & Coke	LAT. °N: 39°59'08"	ELEV. (base lower coal): 1502'	
MINE: Strip mine	LONG. °W: 79°25'35"	TWP.: Springfield	
PERMIT: 71-25	GEOLOGIST: Gabler	15' QUADRANGLE: Confluence	JOINTING: Coal cleat: N75W, 84NE; N15E, 85NW. Strike and
SAMPLING METHOD: Channel	DATE: 7-15-75	7 1/2' QUADRANGLE: Mill Run	dip on claystone: N30W, 3SW.
REPORTED COAL NAMES: Mahoning			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
~15.0	Sandstone			Bn gy																						
3.0	Sandy clay shale		G	Md dk gy to dk gy																						Plant fossils common.
2.2	Coal	0.8	S	Bk	B			X				X	M	1.7	28.2	61.6	8.5	4.9	78.3	1.4	3.9	3.0	13940	8	2080	Few pyrite lenses (<1 mm x 5 mm).
	Clay shale	0.1	S	Gy bk to bk																						
	Coal	1.3	S	Bk	B			X		X	X	X	M	1.3	26.4	52.8	19.5	4.3	68.1	1.2	4.5	2.4	12190	8	2430	
0.1+	Claystone		S	Gy bk to bk																						

SITE/STATION NO. 49-5
COMPANY: Bill Kelley
MINE: Strip mine
PERMIT:
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Upper Freeport

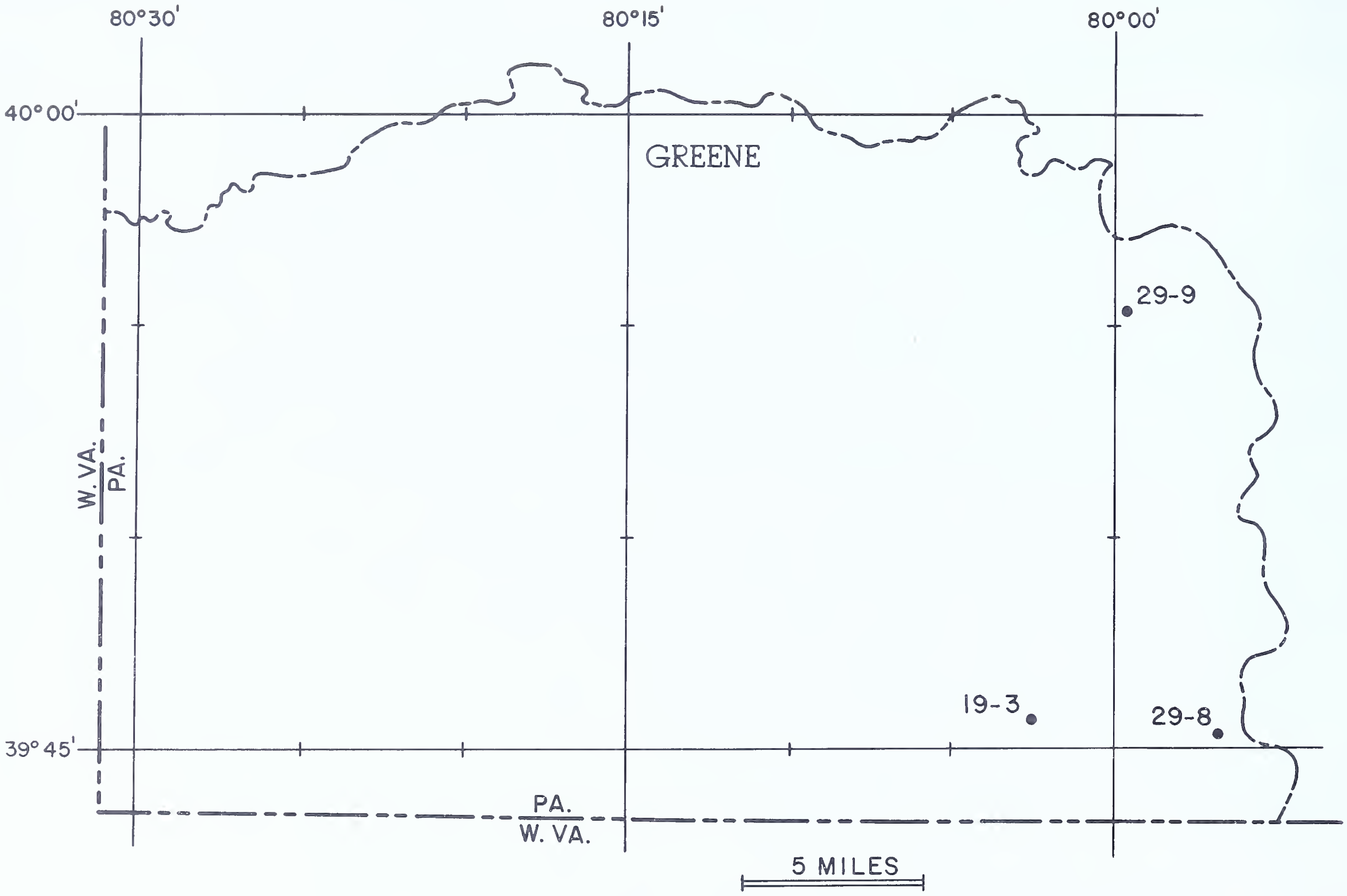
COUNTY: Fayette
LAT. °N: 39°58'19"
LONG. °W: 79°24'39"
GEOLOGIST: Sholes
DATE: 6-25-76

ELEV. (base lower coal):
TWP.: Springfield
15' QUADRANGLE: Confluence
7 1/2' QUADRANGLE: Mill Run

COAL SAMPLE NO(S).: 395819/792439/2A, 395819/792439/2B, 395819/792439/2D, 395819/792439/2F, 395819/792439/2G

JOINTING: Coal cleat: N80W, 85S (face); N78W, 84S; N32E, 70S (butt); N17E, 76S.
WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
24.0	Sandstone			Lt bn																						Very fine to medium grained. Very rubbly and weathered.
0-1.0	Claystone	0-1		Lt gy																						
4.95-5.25	Coal	0.7-1		Bk	B		X			X	X	X	D	4.2	28.2	55.1	12.5	5.0	69.4	1.2	6.8	5.1	12612	9	2140	
	Coal	0.8		Bk	B			X			X	X	D	2.3	22.5	48.0	27.2	4.0	59.1	1.1	5.2	3.4	10581	6½	2515	
	Coaly shale	0.15	S	Bk										2.2	11.2	13.5	73.1	1.8	15.2	0.3	6.3	3.3	2637	0	2800+	
	Coal	0.7	S	Bk	B		X				X	X	D	3.3	24.3	55.1	17.3	4.5	66.2	1.2	5.6	5.2	12000	8½	2095	Much pyrite. Few bands of shale.
	Claystone	1.6	S	Md lt gy																						
	Shaly coal	0.4	G	Bk										3.5	9.6	7.0	79.9	1.5	9.0	0.2	8.2	1.3	1325	0	2800+	Mostly shale with few vitrain layers.
	Coal	0.6	G	Bk	B		X				X	X	MD	1.9	22.6	48.9	26.6	4.0	58.6	1.1	5.1	4.5	10690	6½	2180	
3.0	Claystone		S	Md lt gy																						Soft and sticky.
6.0	Claystone		G	Md gy																						
2.0	Limestone and calcareous claystone		G																							Many clay blocks. Becomes more clayey laterally.
2.5	Claystone		G	Md gy																						Calcareous nodules abundant.
10.4+	Claystone		G	Md gy																						


80°30'
80°15'
80°00'
40°00'
39°45'
GREENE
W. VA.
PA.
PA.
W. VA.
29-9
19-3
29-8
5 MILES

SITE/STATION NO. 19-3	COUNTY: Greene		COAL SAMPLE NO(S).: 394540/800028/2, 394540/800028/4
COMPANY: H & E Coal Co.	LAT. °N: 39°45'40"	ELEV. (base lower coal): 1042'	
MINE: Strip mine	LONG. °W: 80°02'28"	TWP.: Dunkard	
PERMIT: 642-2	GEOLOGIST: Gabler	15' QUADRANGLE: Waynesburg	JOINTING: Coal cleat: N70W, vert.; N18E, vert. Strike and dip of coal: N50E, 2NW.
SAMPLING METHOD: Channel	DATE: 6-18-75	7 1/2' QUADRANGLE: Garards Fort	
REPORTED COAL NAMES: Waynesburg			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.0+	Overburden			Lt gy bn																						
~15.0	Sandstone			Lt bn																						Micaceous.
~18.0	Sandstone		G	Lt gy																						Micaceous.
8.25	Coal	2.1	S	Bk	B		X				X	X	MB	1.7	39.7	46.3	12.3	5.2	71.9	1.5	6.7	2.4	12930	7	2520	[1]
	Clay shale	0.9	S	Md gy to md dk gy																						
	Coal	5.25	S	Bk	B			X			X	X	M	2.1	35.4	47.1	15.4	5.0	68.9	1.4	7.2	2.1	12380	5½	2570	Pyrite lenses rare.[2]
0.5	Claystone		S	Md dk gy																						Plant fossils common.

[1] For trace element analysis, see sample #394540/800028/4.

[2] For trace element analysis, see sample #394540/800028/2.

SITE/STATION NO. 29-8
COMPANY: Kelley Enterprises
MINE: Strip mine
PERMIT: 623-3
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Sewickley

COUNTY: Greene
LAT. °N: 39°45'16"
LONG. °W: 79°56'52"
GEOLOGIST: Gabler
DATE: 6-18-75

ELEV. (base lower coal): 1066'
TWP.: Dunkard
15' QUADRANGLE: Masontown
7 1/2' QUADRANGLE: Masontown

COAL SAMPLE NO(S).: 394516/795652/1A, 394517/795652/1
JOINTING: Coal cleat: N80W, vert.; N20E, 84SE. Strike and dip of coal: N70W, 5NE.
WEATHERING: Fresh

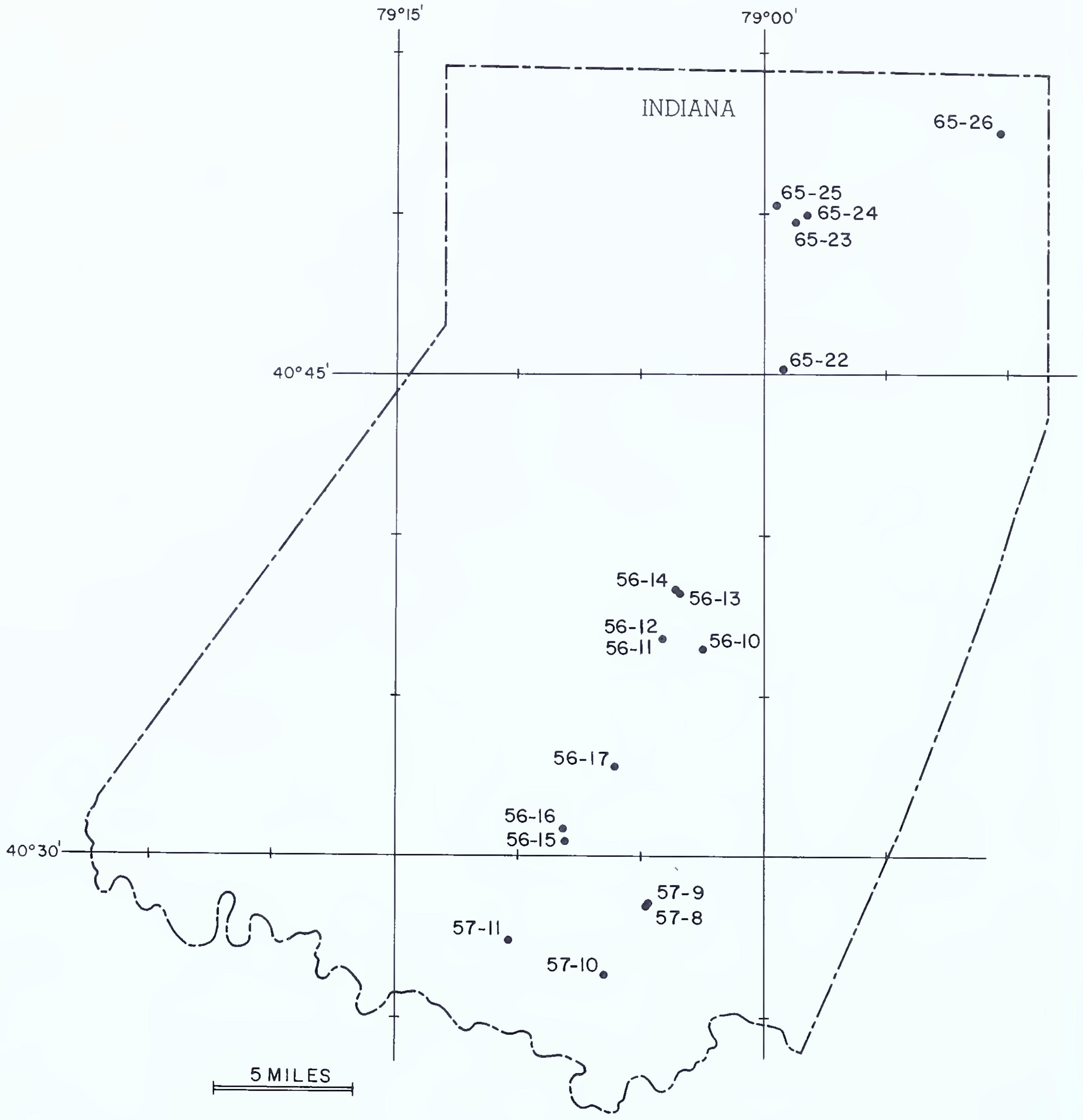
STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
8.0+	Overburden		S	Lt bn																						
2.0	Limestone		S	Lt bn																						
2.0	Claystone		G	Md gy to md dk gy																						
30.0+	Clay-shale laminite		S	Md dk gy to dk gy																						Plant fossils common.
5.6	Bone coal	0.8	S	Bk																						
	Coal	4.8		Bk	B	X				X	X	X	M	2.2	36.1	53.9	7.8	5.3	76.2	1.6	7.7	1.4	13600	8	2520	Pyrite lenses (2 mm x 14 mm).[1]
					B	X					X	X	M	2.3	35.7	53.2	8.8	5.3	75.3	1.6	8.3	0.7	13440	8½	2910+	Pyrite lenses (2 mm x 8 mm).[2]

[1] For trace element analysis, see sample #394516/795652/1A.

[2] For trace element analysis, see sample #394517/795652/1.

SITE/STATION NO.	29-9	COUNTY:	Greene		COAL SAMPLE NO(S).: 395522/795941/2, 395522/795941/4, 395522/795941/6, 395522/795941/8, 395522/795941/10, 395522/795941/12
COMPANY:	West Penn Coal & Const. Co.	LAT. °N: 39°55'22"	ELEV. (base lower coal): 971'		
MINE:	Strip mine	LONG. °W: 79°59'41"	TWP.: Cumberland		
PERMIT:	581-8	GEOLOGIST: Gabler	15' QUADRANGLE: Masontown		JOINTING: Coal cleat: N70W, 85NE; N20E, 84NW.
SAMPLING METHOD:	Channel	DATE: 7-10-75	7 1/2' QUADRANGLE: Carmichaels		
REPORTED COAL NAMES:	Waynesburg				WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mad-bright, mid-lustrous, mad-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
~3.0	Overburden		G	Bn																						
~6.0	Silty clay shale		G	Bn gy																						
~12.0	Sandstone		S	Gy																						Micaceous.
9.1	Coal	0.9	S	Bk	B			X			X	X	MB	1.6	37.7	42.8	17.9	4.8	65.4	1.2	6.0	4.7	11990	6½	2140	
	Clay shale	0.3	S	Dk gy to gy bk																						
	Coal	0.4	S	Bk	B				X	X	X	X	M	1.3	37.0	47.8	13.9	5.2	69.8	1.3	5.2	4.6	12760	6	2140	
	Claystone	0.05	S	Dk gy to gy bk																						
	Coal	1.4	G	Bk	B				X		X	X	MB	1.2	34.0	43.4	21.4	4.5	61.5	1.1	4.0	7.5	11330	5½	2090	
	Claystone	0.1	S	Dk gy to gy bk																						Few plant fossils.
	Coal	2.8	G	Bk	B			X			X	X	M	1.6	35.7	45.4	17.3	4.8	67.4	1.4	6.3	2.8	12120	5½	2430	
	Claystone	0.4	G	Dk gy to gy bk																						
	Coal	0.9	G	Bk	B			X			X	X	MB	1.6	31.5	42.8	24.1	4.5	61.1	1.2	7.2	1.9	11000	6	2910+	
	Claystone	0.05	S	Gy bk to bk																						Few plant fossils.
	Coal	1.8	S	Bk	B			X			X	X	MB	1.8	30.5	44.4	23.3	4.5	62.0	1.2	7.8	1.2	11090	5½	2910+	Pyrite lenses rare.
0.1+	Silty claystone			Md dk gy to dk gy																						


79°15'
79°00'
INDIANA
65-26
65-25
65-24
65-23
40°45'
65-22
56-14
56-13
56-12
56-11
56-10
56-17
56-16
56-15
40°30'
57-9
57-8
57-11
57-10
5 MILES

SITE/STATION NO. 56-10	COUNTY: Indiana		COAL SAMPLE NO(S).: 403627/790235/2A, 403627/790235/2B
COMPANY: Mears Coal Co., Inc.	LAT. °N: 40°36'27"	ELEV. (base lower coal):	
MINE: Chestnut Ridge Mine	LONG. °W: 79°02'35"	TWP.: Cherry Hill	
PERMIT:	GEOLOGIST: Edmunds & Skema	15' QUADRANGLE: Indiana	JOINTING: Coal cleat: N21E, vert. (face).
SAMPLING METHOD: Channel	DATE: 4-8-75	7 1/2' QUADRANGLE: Brush Valley	
REPORTED COAL NAMES: Lower Kittanning			WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS[1]												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Claystone to silty claystone			Md gy																						
4.0	Bony coal	0.4		Bk to gy bk	B				X			X	D	1.6	28.6	58.7	11.1	5.0	75.9	1.3	4.6	2.1	13490			For trace element analysis, see sample #403627/790235/2B.
	Coal	3.6		Bk	B		X					X	MB													For trace element analysis, see sample #403627/790235/2A.
	Claystone			Md gy																						

[1] Proximate and ultimate analyses are composites of both benches.

SITE/STATION NO. 56-11	COUNTY: Indiana	COAL SAMPLE NO(S).: 403645/790412/2A, 403645/790412/2B
COMPANY: Mears Coal Co., Inc.	LAT. °N: 40°36'45" ELEV. (base lower coal):	
MINE: Dixon Run #3 Mine	LONG. °W: 79°04'12" TWP.: Cherry Hill	
PERMIT:	GEOLOGIST: Edmunds & Skema 15' QUADRANGLE: Indiana	JOINTING: Coal cleat: N62W, vert. (face). Spacing not clear. Jointing tightly closed.
SAMPLING METHOD: Channel	DATE: 4-7-75 7 1/2' QUADRANGLE: Brush Valley	
REPORTED COAL NAMES: Lower Kittanning		WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS[1]												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Carain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Silty claystone			Md gy																						Plant fragments and leaves common. Pectinacean noted elsewhere in mine.
3.5	Bony coal	0.3	S	Bk to gy bk	B				X			X	D-MD	1.3	27.7	56.5	14.5	4.5	70.7	1.2	1.6	7.5	12780			2
	Coal	3.2	G	Bk	B		X					X	MB													High fusain content. Very friable. For trace element analysis, see sample #403645/790412/2A.
	Claystone		S	Md gy																						

[1] Proximate and ultimate analyses are composites of both benches.

[2] For trace element analysis, see sample #403645/790412/2B.

SITE/STATION NO.	56-12	COUNTY:	Indiana		COAL SAMPLE NO(S).: 403647/790409/2A, 403647/790409/2B
COMPANY:	Mears Coal Co., Inc.	LAT. °N: 40°36'47"		ELEV. (base lower coal):	
MINE:	Dixon Run #3 Mine	LONG. °W: 79°04'09"		TWP.: Cherry Hill	
PERMIT:		GEOLOGIST: Edmunds & Skema		15' QUADRANGLE: Indiana	JOINTING:
SAMPLING METHOD:	Channel	DATE: 4-7-75		7 1/2' QUADRANGLE: Brush Valley	
REPORTED COAL NAMES:	Lower Kittanning				WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS[1]												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Silty claystone			Md gy																						Plant fragments and leaves common. Pectinacean noted elsewhere in mine.
3.5	Bony coal	0.4	S	Gy bk to bk	B				X			X	D	2.0	27.8	59.3	10.9	4.9	75.3	1.3	4.2	3.4	13520			2
	Coal	3.1	G	Bk	B				X			X	M													High fusain content. Very friable. For trace element analysis, see sample #403647/790409/2A.
	Claystone		S	Md gy																						

[1] Proximate and ultimate analyses are composites of both benches.

[2] For trace element analysis, see sample #403647/790409/2B.

SITE/STATION NO. 56-13	COUNTY: Indiana		COAL SAMPLE NO(S).: 403811/790332/2
COMPANY: Mears Coal Co., Inc.	LAT. °N: 40°38'11"	ELEV. (base lower coal):	
MINE: M. Y. Mine	LONG. °W: 79°03'32"	TWP.: Cherry Hill	
PERMIT:	GEOLOGIST: Edmunds & Skema	15' QUADRANGLE: Indiana	JOINTING:
SAMPLING METHOD: Channel	DATE: 4-8-75	7 1/2' QUADRANGLE: Clymer	
REPORTED COAL NAMES: Lower Kittanning			WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Silty clay shale			Md gy																						Plant fragments and leaves common. Penecontemporaneous massive slump blocks producing very bad roof conditions seen at adit and 400' along main heading. Roof is solid along this point.
3.3	Bony coal	0.2	S	Gy bk	B				X			X	D													
	Coal	3.1	G	Bk	B		X					X	MB	1.7	29.3	58.8	10.2	4.8	76.3	1.3	4.7	2.7	13560			For trace element analysis, see sample #403811/790332/2.
	Claystone		S	Md gy																						

SITE/STATION NO. 56-14	COUNTY Indiana		COAL SAMPLE NO(S).: 403821/790341/2
COMPANY: Mears Coal Co., Inc.	LAT. °N: 40°38'21"	ELEV. (base lower coal):	
MINE: M. Y. Mine	LONG. °W: 79°03'41"	TWP.: Cherry Hill	
PERMIT:	GEOLOGIST: Edmunds & Skema	15' QUADRANGLE: Indiana	JOINTING: Coal cleat: N60W, vert. (face, 0.1'-0.4' spacing).
SAMPLING METHOD: Channel	DATE: 4-8-75	7 1/2' QUADRANGLE: Clymer	
REPORTED COAL NAMES: Lower Kittanning			WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS	
	Silty claystone			Md gy																						Plant fragments.	
3.4	Bony coal	0.2	S	Gy bk	B				X			X	D														
	Coal	3.2	G	Bk	B		X					X	MB	1.5	30.7	59.5	8.3	5.0	78.7	1.4	3.9	2.7	14250			For trace element analysis, see sample #403821/790341/2.	
	Claystone		S	Md gy																							

SITE/STATION NO. 56-15	COUNTY: Indiana		COAL SAMPLE NO(S).: 403019/790805/2A, 403019/790805/2B, 403019/790805/2C
COMPANY: Hawk Bros.	LAT. °N: 40°30'19"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 79°08'05"	TWP.: Center	
PERMIT: 121-8	GEOLOGIST: Skema	15' QUADRANGLE: Indiana	JOINTING: Coal cleat: N55W, vert. (face); N42E, vert.
SAMPLING METHOD: Channel	DATE: 6-15-76	7 1/2' QUADRANGLE: Indiana	(butt). Jointing: N44E, vert. in sandstone.
REPORTED COAL NAMES:			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Carain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
25±	Sandstone			Lt gy to vy lt gy																						Bed thickness decreases upward. Unconformably overlies coal along most of highwall. Large-scale channel crossbedding. Plant remains rare.
0-5.8	Silty claystone		S,U	Md gy																						Thin dark clay laminae at base. Thin sandstone laminae at top and edges of lens.
5.5	Coal	1.4	S	Bk	B		X				X		B	1.7	29.9	55.5	12.9	4.8	71.1	1.3	3.2	6.7	13323	9	2160	Pyrite lenses common.
	Coal	0.6	G	Bk	B				X			X	MD	1.1	18.4	29.8	50.7	3.1	38.5	0.7	4.4	2.6	6870	1	2695	Rare pyrite lenses. Nonvitrain is hard, bony.
	Coal	3.5	G	Bk	B	X				X	X		M	2.7	28.8	62.1	6.4	5.3	78.3	1.5	5.7	2.8	14120	9	2120	Few pyrite lenses.
0.1+	Claystone		S	Lt gy																						Rootworked. Subfissile.

SITE/STATION NO. 56-16
COMPANY: Hawk Bros.
MINE: Strip mine
PERMIT: 121-8
SAMPLING METHOD: Channel
REPORTED COAL NAMES:

COUNTY: Indiana
LAT. °N: 40°30'50"
LONG. °W: 79°08'05"
GEOLOGIST: Skema
DATE: 6-15-76

ELEV. (base lower coal): ~1560'
TWP.: Center
15' QUADRANGLE: Indiana
7 1/2' QUADRANGLE: Indiana

COAL SAMPLE NO(S).: 403050/790805/2A, 403050/790805/2B, 403050/790805/2C, 403050/790805/2D
JOINTING:
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, L=Lat.Grad.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10.0±	Sandstone																									Inaccessible.
4.0	Clay shale		S	Md dk gy																						Plant remains common. Subfissile.
0-1.8	Clay shale		L	Tan																						Inaccessible. Very fissile in appearance.
~0.4	Carbonaceous clay shale		G,L	Dk gy to gy bk																						Vitrain lenses common.
0-3.2	Claystone		G	Lt gy																						Rootworked.
0-5.2	Sand-silt laminite		L	Lt ol gy Md gy																						Plant remains common. Rootworked at top in places. Siltstone is clayey. Siderite pebbles common in places (not in situ).
1.5	Sandstone		S	Lt gy																						Coalified plant remains.
5.3	Coal	1.1	S		B		X				X	X	MB	1.8	28.7	60.6	8.9	4.9	76.5	1.4	5.1	3.2	13770	8	2065	Pyrite lenses common.
	Coal	0.9			B			X	X		X	X	D	1.5	23.1	46.0	29.4	4.3	58.9	1.2	5.6	0.6	10420	5	2800+	Mostly bone with few vitrain lenses.
	Coal	1.8			B	X				X	X		MB	2.1	29.3	63.8	4.8	5.4	80.9	1.6	6.7	0.6	14440	6	2800+	
	Coal	1.5			B		X	X			X	X	MD	2.3	28.5	59.5	9.7	5.2	76.6	1.5	6.3	0.7	13590	9	2800+	
0.1+	Clay shale																									Coalified plant remains, spores common. Subfissile.

SITE/STATION NO. 56-17	COUNTY: Indiana		COAL SAMPLE NO(S).: 403246/790606/1B, 403246/790606/1D
COMPANY: Old Home Manor Coal Co.	LAT. °N: 40°32'46"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 79°06'06"	TWP.: Brush Valley	
PERMIT: 615-4	GEOLOGIST: Skema	15' QUADRANGLE: Indiana	JOINTING: Coal cleat: N55W (face); N44E (butt).
SAMPLING METHOD: Channel	DATE: 6-16-76	7 1/2' QUADRANGLE: Brush Valley	Strike and dip on coal: N88E, 3SE.
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
~8.0	Claystone																									
~1.5	Coal blossom																									Inaccessible.
~1.0	Claystone																									Inaccessible.
~3.0	Sand-silt laminite																									Inaccessible.
~2.0	Sandstone																									Inaccessible.
~4.0	Sand-silt laminite																									Inaccessible.
~15.0	Sandstone		U	Lt gy																						Coarse grained at base. Friable. Overlies coal in places.
3.0	Siltstone		S	Md dk gy																						Plant material common. Coarsens upward.
1.1	Clayey silt shale		S	Dk gy																						Rare thin sand laminae. Few plant remains. Some evidence of rootworking. Few siderite nodules.
1.2	Sand-silt laminite		S	Md lt gy Dk gy																						Thin sandy laminae common.
0.5	Silty clay shale		S	Gy bk																						Carbonaceous.
5.2	Coal	1.7	S	Bk	B		X				X		MB	1.5	28.0	60.9	9.6	4.9	75.2	1.5	4.1	4.7	13588	7½	2060	
	Coal	0.4	S	Bk	B				X			X	D													
	Coal	2.0	S	Bk	B	X					X		MB	1.9	31.8	61.9	4.4	5.4	81.4	1.6	5.9	1.3	14550	9	2405	
	Coal	1.1		Bk																						Underwater. Not sampled.

SITE/STATION NO. 57-8	COUNTY: Indiana			COAL SAMPLE NO(S).: 402828/790456/2A, 402828/790456/2B, 402828/790456/2C	
COMPANY: Dunkard Creek Coal	LAT. °N: 40°28'28"	ELEV. (base lower coal): 1457'			
MINE: Strip mine	LONG. °W: 79°04'56"	TWP.: West Wheatfield		JOINTING: Coal cleat: N74W, 86SW; N70W, 87SW; N19E, 81SE; N28W, 83SE (<½" spacing). Strike and dip on coal: N29E, 4NW. Jointing in siltstone: N34E, 85SE; N57W, 87SW.	
PERMIT: 939-3	GEOLOGIST: Reardon	15' QUADRANGLE: New Florence			
SAMPLING METHOD: Channel	DATE: 6-14-75	7 1/2' QUADRANGLE: New Florence			
REPORTED COAL NAMES: Lower Kittanning				WEATHERING: Fresh	

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
12	Clayey siltstone			Md gy																						
0.2	Carbonaceous clay shale			Bk																						
2.9	Coal	0.8	S	Bk	B		X	X			X	X	MB	4.8	24.0	64.9	6.3	4.7	80.0	1.2	5.4	2.4	13770	8	2190	Thin clay shale laminae at base and 0.3' from base (<1" thick).
	Coal	1.1		Bk	B			X		X	X	X	MB	2.3	28.9	60.0	8.8	4.9	78.1	1.4	5.3	1.5	13770	9	2580	Lenses of shale abundant.
	Carbonaceous clay shale	0.2		Gy bk																						Plant fossils; slickensides.
	Coal	0.8		Bk	B			X			X	X	MB	4.3	26.4	60.9	8.4	5.0	76.3	1.3	7.0	2.0	13460	8½	2480	Streaks and bands of shale common.
	Claystone		S	Dk gy																						Plant fossils.

SITE/STATION NO.	57-9	COUNTY:	Indiana	COAL SAMPLE NO(S).:	402832/790455/2A, 402832/790455/2B, 402832/790455/2C, 402832/790455/2D
COMPANY:	Dunkard Creek Coal	LAT. °N: 40°28'32"	ELEV. (base lower coal): 1457'		
MINE:	Strip mine	LONG. °W: 79°04'55"	TWP.: West Wheatfield	JOINTING:	Coal cleat: N66W, 84SW; N73W, vert.; N16E, 89NW; N29E, 81SE (<½" spacing). Joints in siltstone: N61E, vert.; N64W, vert. Strike and dip on coal: N56E, 11NW.
PERMIT:	939-3	GEOLOGIST: Reardon	15' QUADRANGLE: New Florence		
SAMPLING METHOD:	Channel	DATE: 7-14-75	7 1/2' QUADRANGLE: New Florence		
REPORTED COAL NAMES:	Lower Kittanning			WEATHERING:	Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Bonded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
12	Clayey siltstone			Md gy																						
0.6	Carbonaceous clay shale		S	Bk																						
2.9	Coal	0.6	S	Bk	B		X	X			X	X	MB	2.0	25.6	58.8	13.6	4.6	74.1	1.2	4.1	2.4	13030	7½	2150	Bony at top. Band of shale at base. Pyrite lenses common.
	Coal	0.7		Bk	B		X	X		X	X	X	MB	2.6	27.6	61.4	8.4	4.9	77.7	1.4	4.5	3.1	13730	7½	2080	Prominent band of vitrain at base. Few pyrite lenses.
	Coal	0.8		Bk	B		X				X		MB	2.8	25.4	57.5	14.3	4.6	72.1	1.3	6.6	1.1	12720	9	2910+	Few streaks of pyritic shale.
	Carbonaceous clay shale	0.1		Gy bk																						Plant fossils.
	Coal	0.7		Bk	B				X		X	X	MB	2.8	27.7	61.2	8.3	5.0	77.4	1.3	6.1	1.9	13740	8½	2580	Very rare pyrite lenses.
0.4	Claystone		S	Dk gy																						Plant fossils. Slickensides.

SITE/STATION NO. 57-10 (page 1)	COUNTY: Indiana			COAL SAMPLE NO(S).: 402612/790637/2A, 402612/790637/2B	
COMPANY: North Cambria Fuel Co.	LAT. °N: 40°26'12"	ELEV. (base lower coal):			
MINE: Strip mine	LONG. °W: 79°06'37"	TWP.: West Wheatfield			
PERMIT: Special reclamation proj. 208	GEOLOGIST: Skema	15' QUADRANGLE: New Florence		JOINTING:	
SAMPLING METHOD: Channel	DATE: June 1976	7 1/2' QUADRANGLE: New Florence			
REPORTED COAL NAMES: Upper Kittanning?				WEATHERING: Fresh	

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Cover																									Reddish-brown clay.
4.0+	Clay shale?			Rd bn																						Inaccessible.
~1.5	Carbonaceous claystone			Dk gy bk																						Inaccessible.
~4.0	Claystone			Mt lt gy																						Bottom is shaly. Inaccessible.
8.0	Siltstone		S	Md lt gy																						Fines upward. Base sandy.
3.0	Sand-silt laminite		S	Lt gy Md gy																						Siltstone is very clayey. Rare plant remains.
9.0	Silty claystone		S	Md dk gy																						Rootworked at top. Thin sand laminae at bottom; thin very dark clay laminae at top. 0.2' dark bed visible at top in places (inaccessible).
1.4	Sand-silt laminite		S	Lt gy Md dk gy																						Few plant leaves.
	Bone coal	0.3	S	Bk																						Pyrite common. Carbonaceous plant material perpendicular to bedding (possibly rootworking).
	Coal	2.5	G	Bk	B		X				X		B	2.8	24.8	62.5	9.9	4.9	74.7	1.3	5.2	4.0	13480	9	2125	Few fusain and pyrite lenses. Very friable.
4.7	Claystone	0.2	S	Bn gy																						Rootworked.

SITE/STATION NO. 57-10 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS										FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUN-DANCE				THICK-NESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND			
			S																							
	Coal	1.1		Bk	B	X					X	X	MB	2.2	23.7	65.1	9.0	5.1	77.3	1.3	4.6	2.7	13820	9	2130	Coal is very friable (easily goes to dust).
			S																							
	Coal	0.6		Bk	B	X					X	X	MB													Pyrite lenses common.
			S																							
0.1+	Claystone			Md lt gy																						

SITE/STATION NO. 57-11	COUNTY: Indiana		COAL SAMPLE NO(S).: 402721/791027/2A, 402721/791027/2B
COMPANY: North Cambria Fuel Co.	LAT. °N: 40°27'21"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 79°10'27"	TWP.: Burrell	JOINTING: Coal cleat: N54W, vert. (face); N33E, vert. (butt). Strike and dip on coal: N61E, 6NW. Jointing in sandstone: N55E; N35W; N74E; N44W (all vert.).
PERMIT: 10-27	GEOLOGIST: Skema	15' QUADRANGLE: New Florence	
SAMPLING METHOD: Channel	DATE: 6-16-76	7 1/2' QUADRANGLE: Bolivar	
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, L=Lat Grad.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
~10	Sandstone																									Inaccessible.
~10	Sandstone																									Inaccessible.
10-20	Sand-silt laminite																									Inaccessible.
8-25	Sandstone			Lt gy																						Inaccessible. Large-scale crossbedding. Rare thin silty laminae.
0-4	Clay shale		L	Ol gy																						Inaccessible.
0-10	Silty claystone		L	Md dk gy																						Top inaccessible. Abundant flakes of biotite.
0-4.7	Sandy siltstone		S	Md gy																						Abundant thin sand laminae. Goes to sand-silt laminite at top. Few plant remains.
3.2-4.5	Silty clay shale		S	Md gy																						Rare pyrite crystals <1/32".
3.9	Coal	3.2	S		B	X					X		MB	1.5	27.7	58.5	12.3	4.8	74.3	1.4	5.5	1.7	13350	7	2595	Thin pyrite lenses rare (~1/32" thick). Few thin fusain laminae (~1/32" thick).
	Coal	0.7	S		B			X				X	MD	2.6	21.7	40.8	34.9	3.8	51.3	0.9	6.2	2.9	9260	7	2685	Hard, bony.
0.1+	Claystone		S																							

SITE/STATION NO. 65-22	COUNTY: Indiana		COAL SAMPLE NO(S).: 404508/785918
COMPANY: Marion Center Mining Co.	LAT. °N: 40°45'08"	ELEV. (base lower coal): 1587'	
MINE: Strip mine	LONG. °W: 78°59'18"	TWP.: Grant	
PERMIT:	GEOLOGIST: Hempel	15' QUADRANGLE: Punxsutawney	JOINTING: Coal cleat: N35W, vert. (face); N50E, vert. (butt).
SAMPLING METHOD: Channel	DATE: Summer 1975	7 1/2' QUADRANGLE: Rochester Mills	
REPORTED COAL NAMES: Lower Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Cover																									
~4	Siltstone?		G																							Inaccessible.
~4	Shale		G																							
0.5	Coal		S	Bk																						
6.0	Silty clay shale		S	Md dk gy																						Rootworked.
5.0	Sandstone		S	Lt ol gy																						Plant fossils abundant.
7.0	Siltstone		S	Md dk gy																						Plant fragments abundant.
2.2	Coal		S	Bk	B			X			X	X	B	2.9	30.4	57.7	9.0	5.1	76.4	1.4	6.1	2.0	13540	8½	2300	
	Claystone		S	Lt gy																						Rootworked.

SITE/STATION NO. 65-23	COUNTY Indiana		COAL SAMPLE NO(S).. 404943/785852, 404945/785848
COMPANY: Lamkie Coal Co.	LAT °N: 40°49'43"	ELEV. (base lower coal): 1503'	
MINE: Strip mine	LONG. °W: 78°58'52"	TWP.: Canoe	
PERMIT: 107-10	GEOLOGIST: Hempel	15' QUADRANGLE: Punxsutawney	JOINTING: Coal cleat: N55W, vert.; N58W, vert. (face ; N40E, vert.; N29E, vert. (butt).
SAMPLING METHOD: Channel	DATE: Summer 1975	7 1/2' QUADRANGLE: Rochester Mills	
REPORTED COAL NAMES: Lower Freeport			WEATHERING: Fresh

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded (B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
15+	Silt shale																									
			S																							
1.0	Sandstone			Lt gy																						
			S																							
2.0	Silt shale			Md ol gy																						
			S																							
1.2	Sandstone			Lt gy																						
			S																							
4.1	Silt shale			Md gy																						
			S																							
1.9	Coal			Bk	B			X	X				MD	1.9	30.0	56.8	11.3	4.8	75.0	1.3	5.1	2.5	13280	8	2130	
														1.6	31.2	57.9	9.3	4.9	76.2	1.4	5.1	3.1	13680	9	2130	Sample =404945/785848.
			S																							
	Claystone			Lt gy																						Rootworked.

SITE/STATION NO. 65-24	COUNTY: Indiana		COAL SAMPLE NO(S).: 404958/785815/2, 404958/785815/5, 404958/785813
COMPANY: Elkin Coal Co.	LAT. °N: 40°49'58"	ELEV. (base lower coal): 1590'	
MINE: Strip mine	LONG. °W: 78°58'15"	TWP.: Canoe	
PERMIT:	GEOLOGIST: Hempel	15' QUADRANGLE: Punxsutawney	JOINTING: Coal cleat (Upper Freeport): N40E, vert. (face); N55W, vert.
SAMPLING METHOD: Channel	DATE: Summer 1975	7 1/2' QUADRANGLE: Rochester Mills	
REPORTED COAL NAMES: Upper and Lower Freeport			WEATHERING: Weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)									
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
~0.6	Coal		S	Bk																						Not accessible.
18.0	Silty claystone		S	Dk gy																						Plant fragments abundant.
1.9	Coal (Upper Freeport)		S	Bk	B			X					D	3.5	29.3	57.3	9.9	4.9	73.7	1.3	6.7	3.5	13110	9	2100	
														4.3	29.4	52.6	13.7	4.9	70.3	1.3	7.9	1.9	12350	7½	2140	Sample #404958/785813.
3.0±	Claystone		S	Lt gy																						Rootworked.
25.0	Siltstone		S	Dk gy																						Plant fragments abundant. Sandy lenses common.
1.8	Coal (Lower Freeport)		S	Bk	B			X					MB	2.2	31.5	59.1	7.2	5.0	78.7	1.3	6.3	1.5	13860	8½	2320	Wet.
	Claystone			Dk gy																						Rootworked.

SITE/STATION NO.	65-25	COUNTY:	Indiana	COAL SAMPLE NO(S).:	405013/784934
COMPANY:	Benjamin Coal Co.	LAT °N:	40°50'13"	ELEV. (base lower coal):	~1740'
MINE:	Strip mine	LONG. °W:	78°49'34"	TWP.:	Banks
PERMIT:		GEOLOGIST:	Hempel	15' QUADRANGLE:	Punxsutawney
SAMPLING METHOD:	Channel	DATE:	7-15-75	7 1/2' QUADRANGLE:	Burnside
REPORTED COAL NAMES:	Upper Freeport				

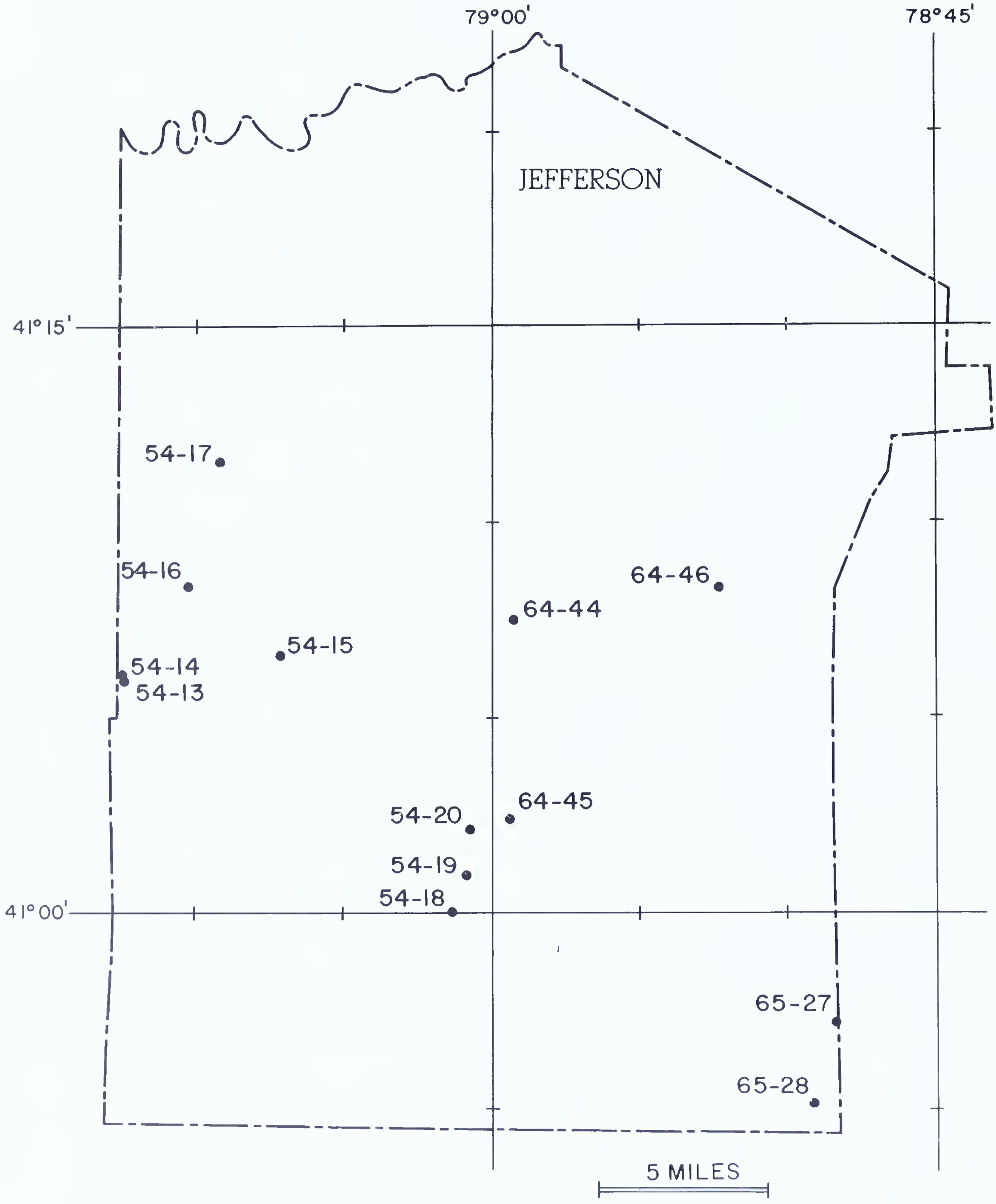
JOINTING: Coal cleat: N30E, vert.; N35E, vert. (face); N68W, vert.; N60W, vert.; N60W, vert. (butt).

WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)									
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S: Sharp, G: Gradational, U: Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Cover																									
	Sandstone		U																						Hard, clean.
4.0±	Silt-clay laminite		S	Lt gy Dk gy																					Plant fragments common.
2.1	Coal		S		B			X				X	B	1.6	30.8	58.7	8.9	5.1	77.5	1.4	4.3	2.8	13800	9	2090	
0.3+	Claystone																								Rootworked. Plant fossils abundant.

SITE/STATION NO. 65-26	COUNTY Indiana		COAL SAMPLE NO(S).: 405232/785016/2, 4, 9A, 9B
COMPANY: Benjamin Coal Co.	LAT. °N: 40°52'32"	ELEV. (base lower coal): 1712'	
MINE: Strip mine	LONG. °W: 78°50'16"	TWP.: Banks	
PERMIT: 64-104	GEOLOGIST: Hempel	15' QUADRANGLE: Punxsutawney	JOINTING: Coal cleat (Middle Kittanning): N55W, vert.;
SAMPLING METHOD: Channel	DATE: 7-15-75	7 1/2' QUADRANGLE: McGees Mills	N61W, vert. (face); N40E, vert. (butt). Strike and dip on
REPORTED COAL NAMES: Middle Kittanning			WEATHERING: Fresh lower coal: N74E, 5NW.

STRATIGRAPHIC DATA														COAL ANALYSIS												
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL									PROXIMATE (%)			ULTIMATE (%)						BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
						VITRAIN																				
						ABUNDANCE				THICKNESS																
					Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR				
	Coal																									Blossom at top of highwall. Inaccessible.
	Claystone?																									Inaccessible.
8+	Sandstone																									
7-8	Silt shale		S	Md dk gy																						Lingula common.
3.2 (Middle Kittanning)	Coal	1.15	S	Bk										1.5	28.5	51.4	18.6	4.7	69.2	1.2	4.9	1.4	12190	9	2580	
	Bone coal	0.05		Bk																						
	Coal	2.0		Bk										1.5	29.0	64.0	5.5	5.2	81.4	1.3	5.5	1.1	14350	9	2460	
5.0	Silty claystone to siltstone		S	Md dk gy																						Upper several inches is fine-grained, very hard, silty sandstone. Plant fragments abundant.
0.1	Coal		S	Bk																						
1.5	Claystone		S	Md gy																						
5.5	Sandstone		S	Lt gy																						Crossbedding common. Coalified plant stems and plant material abundant.
1.0	Coal		S	Bk										3.2	29.2	57.7	9.9	5.0	74.3	1.0	5.5	4.3	13270	9	2090	Pyrite blebs (½"-1" diameter).
10.0	Silty claystone		S	Md dk gy																						
2.0	Coal		S	Bk	B			X			X	X	B	2.8	27.5	64.2	5.5	5.2	80.4	1.2	6.3	1.4	14160	9	2290	
0.6+	Claystone		S	Bn gy																						Slickensides common. Plant fossils abundant.


79°00'
78°45'
JEFFERSON
41°15'
54-17
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64-46
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54-15
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64-45
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54-18
41°00'
65-27
65-28
5 MILES

SITE/STATION NO.	54-13	COUNTY:	Jefferson		COAL SAMPLE NO(S).: 410555/791233/2A, 410555/791233/2B
COMPANY:	Alvin Gearhart	LAT. °N: 41°05'55"	ELEV. (base lower coal): ~1420'		
MINE:	Strip mine	LONG. °W: 79°12'33"	TWP.: Clover		
PERMIT:	632-4	GEOLOGIST: Reardon & Inners	15' QUADRANGLE: Brookville		JOINTING: Coal cleat: N70W, vert.; N60W, vert. (face);
SAMPLING METHOD:	Channel	DATE: Summer 1975	7 1/2' QUADRANGLE: Summerville		N27E, vert.; N15E, vert. (butt). Joint in sandstone:
REPORTED COAL NAMES:	Lower Freeport				WEATHERING: Fresh · N65E, 89NW (curved).

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)			ULTIMATE (%)										
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
45.0	Sandstone			Lt gy																						Massive with discontinuous shaly zones up to 5' thick.
3.0-4.5	Silty claystone		U	Md lt gy																						Splintery fracture.
4.8-6.1	Coal	0-1.3	S	Bk	B				X			X	D-MD													Partially weathered. Discontinuous.
	Coal	2.5		Bk	B	X	X			X	X	X	MD	2.0	34.4	49.2	14.4	4.8	68.1	1.3	7.3	4.1	12360	7	2330	For trace element analysis, see sample #410555/791233/2B.
	Coal	2.3		Bk	B	X				X	X	X	MD-MB	1.7	35.9	52.9	9.5	5.2	73.8	1.5	8.4	1.6	13310	8	2530	For trace element analysis, see sample #410555/791233/2A.
	Covered																									

SITE/STATION NO. 54-14
COMPANY: Alvin Gearhart
MINE: Strip mine
PERMIT: 632-4
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Lower Freeport

COUNTY: Jefferson
LAT. °N: 41°05'56"
LONG. °W: 79°12'33"
GEOLOGIST: Reardon & Inners
DATE: 6-3-75

ELEV. (base lower coal): ~1420'
TWP.: Clover
15' QUADRANGLE: Brookville
7 1/2' QUADRANGLE: Summerville

COAL SAMPLE NO(S): 410556/791233/2A, 410556/791233/2B, 410556/791233/2C, 410556/791233/2D
JOINTING: Coal cleat: N70W, vert.; N62W, vert. (face); N45E, vert.; N32E, vert. Joints in sandstone: N12E, 80SE; N64E, 78SE; N10E, 79NW.
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded(B),Non-Banded (N),or Mixed (M)	>60%	30-60%	15-30%	<15%	>5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright,mod-bright,mid-lustrous,mod-dull,dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0-15	Sand-silt laminite			Lt gy																						Inaccessible. Grades laterally into underlying sand.
8-30	Sandstone		G	Md lt gy																						Abundant feldspar. Shaly streaks. Massive.
12±	Silty claystone		S	Bk to gy bk																						Iron staining. Slickensides. Becomes shaly in upper part.
8.4	Coal	0.5	S	Bk	B			X	X	X	X	X	D													Weathered.
	Coal	1.7		Bk	B		X	X		X	X	X	MD	2.9	33.5	53.8	9.8	5.2	72.5	1.4	9.3	1.8	12900	6½	2910+	Few thin streaks of pyrite. For trace element analysis, see sample #410556/791233/2D.
	Coal	1.3		Bk	B		X			X	X	X	MD	3.5	29.5	45.5	21.5	4.6	59.5	1.2	11.9	1.3	10720	1½	2910+	Few thin streaks of pyrite. Somewhat bony. For trace element analysis, see sample #410556/791233/2C.
	Coal	2.9		Bk	B	X	X			X	X	X	B	2.7	34.3	59.9	3.1	5.5	79.1	1.6	9.6	1.1	14080	7½	2260	Discontinuous pyrite lenses (up to ¼" x 2') common. For trace element analysis, see sample #410556/791233/2B.
	Coal	2.0		Bk	B	X	X				X	X	MD	2.3	33.2	48.9	15.6	4.8	68.5	1.4	8.7	1.0	12100	5	2840	Few thin streaks of pyrite. Discontinuous bony parting (½" thick) 0.7' from base. For trace element analysis, see sample #410556/791233/2A.
	Clay shale		S	Bn bk																						

SITE/STATION NO. 54-15	COUNTY: Jefferson		COAL SAMPLE NO(S).: 410636/790713/2, 410637/790715/2
COMPANY: Baughman Coal Co.	LAT. °N: 41°06'36"	ELEV. (base lower coal): ~1584'	
MINE: Strip mine	LONG. °W: 79°07'13"	TWP.: Rose	
PERMIT: 151-65	GEOLOGIST: Hempel	15' QUADRANGLE: Brookville	JOINTING: Coal cleat: N43W, vert.; N49W, vert.; N52W,
SAMPLING METHOD: Channel	DATE: 6-2-75	7 1/2' QUADRANGLE: Coolspring	vert. (face); N50E, vert.; N48E, vert.; N53E, vert. (butt).
REPORTED COAL NAMES: Lower Kittanning			WEATHERING: Very weathered

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded (B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5.0	Clay shale																									Siderite nodules abundant. Inaccessible.
			S																							
0.5	Carbonaceous clay shale			Bk																						
			S																							
2.5	Clay shale			Gy bk																						Brachiopods abundant (1-10 mm).
			S																							
5.7	Claystone			Gy bk																						Brachiopods common (1-10 mm). Siderite nodules common. Sphalerite (wurtzite?) in siderite nodules.
			S																							
1.3	Claystone			Dk gy																						Pyritized brachiopods (1-2 mm). Few siderite nodules.
			G																							
1.7	Coal			Bk	B			X				X	D	2.1 1.7	37.3 37.0	48.9 50.9	11.7 10.4	5.3 5.0	73.2 74.1	1.4 1.5	7.6 7.8	0.8 1.2	13130 13330	6½ 7½	2910+ 2910+	Sample #410637/790715.
			S																							
	Claystone			Lt ol gy																						Rootworked.

SITE/STATION NO. 54-16	COUNTY: Jefferson		COAL SAMPLE NO(S).: 410816/791013/2A, 410816/791013/2B
COMPANY: Stahlman Coal Co.	LAT. °N: 41°08'16"	ELEV. (base lower coal): ~1265'	
MINE: Strip mine	LONG. °W: 79°10'13"	TWP.: Clover	
PERMIT: 9-43	GEOLOGIST: Reardon & Inners	15' QUADRANGLE: Brookville	JOINTING: Coal cleat: N70W, 88SW; N75W, 87NE (face); N32E
SAMPLING METHOD: Channel	DATE: 6-3-75	7 1/2' QUADRANGLE: Corsica	81NW; N31E, 88NW (butt).
REPORTED COAL NAMES: Clarion			WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
20.0±	Clay shale			Dk gy																						Jointing: N25W, vert.; N30E, vert. (curved).
1.0	Coal			Bk	B			X			X	X	D													Highly weathered. Few pyrite lenses.
5.7	Silty claystone			Dk gy																						Slickensides.
2.9	Coal	1.9		Bk	B			X	X		X	X	MD	1.9	38.6	47.3	12.2	5.0	71.0	1.1	4.6	6.1	12930	7	2070	Pyrite abundant in lenses. Bony band (0.2' thick) at base.[1]
	Coal	1.0		Bk	B			X			X	X	MB	3.1	37.5	51.2	8.2	5.2	73.6	1.2	7.3	4.5	13370	7½	2080	Pyrite lenses abundant.[2]
	Claystone			Ol gy																						Hard.

[1] For trace element analysis, see sample #410816/791013/2B.

[2] For trace element analysis, see sample #410816/791013/2A.

SITE/STATION NO. 54-17	COUNTY: Jefferson		COAL SAMPLE NO(S).: 411137/790917/2A, 411137/790917/2B
COMPANY: Bracken Const. Co.	LAT. °N: 41°11'37"	ELEV. (base lower coal): ~1648'	
MINE: Strip mine	LONG. °W: 79°09'17"	TWP.: Union	
PERMIT: 1169-1	GEOLOGIST: Inners & Reardon	15' QUADRANGLE: Brookville	JOINTING: Coal cleat: N56W, vert.; N62W, vert. (face);
SAMPLING METHOD: Channel	DATE: 6-2-75	7 1/2' QUADRANGLE: Corsica	N49E, vert.; N35E, 87SE; N29E, 89E (butt).
REPORTED COAL NAMES: Upper Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, L=Lat Grad.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS	
20.0±	Sandstone			Md lt gy																						Feldspathic. Micaceous. Thick bedded. Few plant stems. Planar bedding, minor crossbedding.	
7.0±	Sandstone		G,L	Md lt gy																						Plant stems and small trunks abundant. Feldspathic. Highly micaceous.	
0-1.8	Silty clay shale		U	Dk gy																							
0.6	Coal		S	Bk	B		X				X		D													Somewhat bony.	
1.8	Clay shale		S	Md gy																						Subfissile. Possibly rootworked. Plant leaves abundant, stems common.	
2.0	Bony coal	0.3	S	Gy bk	B			X			X	X	D	1.9	32.8	47.4	17.9	4.6	65.9	1.0	7.4	3.2	11870	6½	2450	Hard. Rare very thin streaks and lenses of pyrite.	
	Clay shale	0.1		Gy bk																						Carbonaceous with vitrain common (<2 mm thick).	
	Coal	1.6		Bk	B	X	X				X	X	MB	2.9	34.7	48.9	13.5	4.9	69.1	1.1	8.4	3.0	12460	8	2190	Thin pyrite lenses abundant (¼"-6" thick).	
	Claystone		S	Ol gy																						Soft, plastic.	

SITE/STATION NO. 54-18 (page 1)
COMPANY: Glenn Coal Co.
MINE: Strip mine
PERMIT: 343-19
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Middle Kittanning

COUNTY: Jefferson
LAT. °N: 41°00'00"
LONG. °W: 79°01'29"
GEOLOGIST: Skema
DATE: 6-18-76

ELEV. (base lower coal):
TWP.: Oliver
15' QUADRANGLE: Brookville
7 1/2' QUADRANGLE: Coolspring

COAL SAMPLE NO(S).: 410000/790129/2, 410000/790129/6
JOINTING: Coal cleat: N56W (face); N29E, vert. (butt).
Jointing in sand-silt laminite: N55W, vert.; N48E, vert.
WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
29.0±	Silty sandstone	9.0																								Few thin silty laminae.
	Cover	20.0±																								Loose blocks of sandstone (1'-2' thick) at top.
1.0±	Coal																									Inaccessible.
15.0±	Claystone?																									Inaccessible.
10±	Sandstone																									Few thin silt laminae. Top inaccessible.
0.5	Coal			Bk	B		X				X		MB	13.5	27.9	48.5	10.1	5.2	61.3	1.2	21.5	0.6	10458	0	2405	Rolls 1'-2' in short distance.
21.1±	Silty clay shale	0.8	S	Md dk gy																						Abundant good leaf impressions.
	Clayey siltstone	3.5	G	Md dk gy to md gy																						Rootworked. Common plant fragments; good leaf impressions.
	Cover	3±																								
	Silt shale	9.0		Md dk gy to md gy																						Few plant fossils.
	Clay shale	1.7		Dk gy to md dk gy																						Very fissile.
	Silt shale	3.1	S	Md dk gy																						Fining upward. Clayey at top.
17.0	Sand-silt laminite		S	Md dk gy Lt gy																						Plant fragments common. Several 1'-2' sand beds at top.

SITE/STATION NO. 54-18 (page 2)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT °N: / ELEV. (base lower coal):	
MINE:	LONG. °W: / TWP.:	
PERMIT:	GEOLOGIST: / 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: / 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.2	Clay shale		S	Dk gy																						Wet, semiplastic clay.
1.7	Coal		S	Bk	B		X				X	X	MD	3.4	24.5	62.3	9.8	4.9	75.1	1.1	8.2	0.9	13211	8	2735	Vitrain in lower part near 60%; grades to 30% at top.
0.1+	Sandstone		S	Lt gy																						Rootworked.

SITE/STATION NO. 54-19	COUNTY. Jefferson		COAL SAMPLE NO(S).: 410057/790058/10
COMPANY: S & M Coal Co.	LAT. °N: 41°00'57"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 79°00'58"	TWP.: Oliver & McCalmont	
PERMIT: 1005-2	GEOLOGIST: Skema	15' QUADRANGLE: Brookville	JOINTING: Coal cleat: N50W, vert. (face); N41E, vert.
SAMPLING METHOD: Channel	DATE: 6-18-76	7 1/2' QUADRANGLE: Coolspring	(butt). Jointing in upper sandstone: N56W, vert.; N65E, vert.
REPORTED COAL NAMES: Middle Kittanning			WEATHERING: Fresh

STRATIGRAPHIC	DATA													COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, L=Lat.Grad.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
25.0±	Sandstone																									Rare thin siltstone beds throughout (1"-2"). Silty at top.
3.5	Coal				B		X				X	X	M	7.3	26.9	61.3	4.5	5.1	72.3	1.2	16.3	0.6	12360	0	2800+	Shaly at bottom. Bottom 0.6' wet and not sampled.
4.0	Sandstone			Lt gy																						
18.0	Sandstone																									Massive. Inaccessible.
1.5	Claystone		L	White																						Top is inaccessible.
18.0	Silty claystone			Gy bk																						
2.0	Silty sandstone		S	Md lt gy																						
6.5	Silt shale		G	Md dk gy																						
2.0	Carbonaceous clay shale		G	Gy bk to dk gy																						Plant leaf fossils rare.
6.0	Sandstone		S	Lt gy																						Plant fossils common. Top appears rootworked. Few silt laminae.
15.0	Clay shale		L	Gy bk to md dk gy																						Thin dark-gray clay laminae common.
0.1+	Coal		S	Bk																						

SITE/STATION NO. 54-20 (page 1)	COUNTY: Jefferson		COAL SAMPLE NO(S).: 410205/790054/1, 410205/790054/2, 410205/790054/3, 410205/790054/4
COMPANY: P & N Coal Co.	LAT. °N: 41°02'05"	ELEV. (base lower coal): 1528.9'	
MINE: Drill Hole #1 Co.	LONG. °W: 79°00'54"	TWP.: McCalmont	
PERMIT:	GEOLOGIST: Skema	15' QUADRANGLE: Brookville	JOINTING:
SAMPLING METHOD: Drill hole core	DATE: 3-15-76	7 1/2' QUADRANGLE: Coolspring	
REPORTED COAL NAMES: Clarion, Lower Kittanning, and Middle Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2.8	Sandstone			Lt gy to md lt gy																						Fine to medium grained. Silty at top. Coal stringers at base.
3.3	Coal (Middle Kittanning)			Bk										3.21	29.52	56.34	10.93					0.74	13006	8	2800+	
2.1	Clay-silt laminite			Md gy Dk gy																						Zone of coal stringers (0.3' thick) 1.2' from top.
10.9	Sandstone																									Fines upward. Fine to coarse grained. Coal stringers 1.7' from base.
0.5	Clayey siltstone			Md gy																						
2.7	Sandstone			Lt gy																						Medium grained. Clay chips at base.
1.8	Sand-silt laminite		G	Lt gy Md dk gy																						Sandy at base. Fine to medium grained.
1.0	Coal (Middle Kittanning--lower rider)		S	Bk	B				X			X	D	0.7	19.4	21.1	58.8	2.7	30.1	0.5	4.8	3.1	5510	1	2800+	0.1' of very bony coal at top.
31.0	Sandstone		S	Lt gy to vy lt gy																						Fine to coarse grained.
3.1	Sand-silt laminite		S	Lt gy Md dk gy																						Coarsens upward.
1.9	Clayey siltstone		G	Dk gy																						Coarsens upward.

SITE/STATION NO. 54-20 (page 2)	COUNTY:	COAL SAMPLE NO(S).
COMPANY:	LAT. °N: ELEV. (base lower coal):	
MINE:	LONG. °W: TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clorain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE SWELLING INDEX	ASH SOFTENING TEMPERATURE (°F)	COMMENTS
13.9	Sandstone		G	Lt gy to wh																						Fines upward. Fine to coarse grained
1.5	Coal (Lower Kittanning)		S	Bk										1.6	35.23	43.10	20.07					5.25	11650	5½	2240	
17.5	Sandstone		S	Lt gy and md dk gy																						Fine to coarse grained. Silty at top and bottom.
8.6	Clay shale		S	Dk gy to md gy																						
2.6	Limestone		G	Md dk gy and lt ol gy																						Clayey at top. Invertebrate fossils common at top (pelecypods, brachiopods-productid?).
1.0	Shaly coal	0.4	S	Bk	B				X		X	X	D													Vitrain more abundant at top. Very clayey at base. Pyrite.
	Clay shale	0.6	G	Gy bk																						
6.0	Sand-silt laminite shale		S	Md lt gy Md dk gy																						Fine to very fine grained. Coarsens upward.
13.7	Silt shale		G	Md dk gy																						Siderite nodules at base. Coarsens upward. Clayey at base. Sandy at top.

SITE/STATION NO. 54-20 (page 3)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1.0 (Clarion?)	Coal	0.3	S	Bk	B				X			X	D													Thin clay partings throughout. Pyrite lenses.
	Coal	0.7		Bk	B		X				X	X	MB													White sulfate stain at top and bottom.
2.9	Siltstone		S	Md gy																						Sandy at base. Plant fossils abundant.
9.3	Sandstone		S	Lt gy																						Medium to coarse grained.
4.7	Sand-silt laminite		S	Lt gy Md dk gy																						Very fine to fine grained.
1.1	Coal (Clarion)		S	Bk										1.9	31.24	47.92	18.94					2.85	11809	6	2690	
2.0	Claystone		S	Ol gy and md lt gy																						Rootworked. Medium light gray at base.

SITE/STATION NO. 64-44	COUNTY: Jefferson		COAL SAMPLE NO(S).: 410725/785918/1B, 410725/785918/1A
COMPANY: Baughman Coal Co.	LAT. °N: 41°07'25"	ELEV. (base lower coal): 1627'	
MINE: Strip mine	LONG. °W: 78°59'18"	TWP.: Pine Creek	JOINTING: Coal cleat: N40W, vert.; N55W, vert.; N50W,
PERMIT:	GEOLOGIST: Hempel & Skema	15' QUADRANGLE: DuBois	vert. (face); N55E, vert.; N57E, vert.: N65E, vert.
SAMPLING METHOD: Channel	DATE: 6-5-75	7 1/2' QUADRANGLE: Reynoldsville	(butt). Strike and dip on coal: N45W, 4SW.
REPORTED COAL NAMES: Upper Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS: PROXIMATE (%)				ULTIMATE (%)								
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Cover																									
3.0	Sandstone			Gy bn																						Jointing: N70W, vert. (5' spacing); N-S, vert. (10' spacing). Plant fragments abundant.
6.0	Silty clay shale		S	Md gy																						Plant fragments common. Siderite nodules rare. Subfissile.
2.0	Coal	1.6	S	Bk	B			X			X	X	MD	7.1	29.8	58.3	4.8	5.5	75.9	1.2	12.1	0.5	13330	7½	2460	Pyrite blebs common.[1]
	Fusain	0.1	S	Bk																						
	Coal	0.3	S	Bk	B			X			X		MD	4.0	32.0	61.5	2.5	5.4	80.5	1.3	9.8	0.5	14150	8½	2910+	[2]
	Claystone		S	Dk gy																						Rootworked.

[1] For trace element analysis, see sample #410725/785918/1B.

[2] For trace element analysis, see sample #410725/785918/1A.

SITE/STATION NO. 64-45	COUNTY: Jefferson			COAL SAMPLE NO(S).: 410225/785930/1, 410225/785930/2	
COMPANY: P & N Coal Co.	LAT °N: 41°02'25"	ELEV. (base lower coal): 1599.1'			
MINE: Drill Hole #2	LONG. °W: 78°59'30"	TWP.: McCalmont			
PERMIT:	GEOLOGIST: Skema	15' QUADRANGLE: DuBois		JOINTING:	
SAMPLING METHOD:	DATE: 3-26-76	7 1/2' QUADRANGLE: Reynoldsville			
REPORTED COAL NAMES: Middle Kittanning and Lower Kittanning				WEATHERING:	

STRATIGRAPHIC DATA													COAL ANALYSIS													
					COAL								PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10.6	Silt shale			Gy bk to dk gy																						Clay laminae common in places. Sand lenses and laminae common at bottom. Rare *Lingula* and pelecypods 4'-6' from top.
3.5	Coal (Middle Kittanning)			Bk										3.08	31.52	45.02	20.38					3.91	11474	6½	2150	
55.5	Sandstone																									Rootworked in top 1'. Coal, siderite, and clay chips abundant at base. Fines upward from coarse to very fine grained.
19.0	Silt shale																									Sandy at top. Clayey at base.
3.1	Coal (Lower Kittanning)			Bk										3.16	32.49	52.94	11.41					2.37	13021	8½	2140	
0.6	Siltstone																									Rootworked.
0.5	Coal (Lower Kittanning)			Bk	B			X				X	MD													
11.9	Silty sandstone																									Rootworked at top. Silt content increases upward. Base is clean fine-grained sand.

SITE/STATION NO. 64-46 (page 1)	COUNTY: Jefferson		COAL SAMPLE NO(S).: 41[illegible]12'785224'[illegible], [illegible]
COMPANY: Krach & Gearhart	LAT °N: 41°08'12"	ELEV. (base lower coal):	410812'785224'2A
MINE: Strip mine	LONG. °W: 78°52'24"	TWP.: Washington	JOINTING: Coal cleat on Upper Kittanning: [illegible]
PERMIT: 635-5	GEOLOGIST: Hempel & Skema	15' QUADRANGLE: DuBois	N40W, vert.; N45W, vert. (face); N53E, vert.; [illegible], vert.
SAMPLING METHOD: Channel	DATE: Summer 1975	7 1/2' QUADRANGLE: Falls Creek	N52E, vert. (butt). Jointing in overlying rock: [illegible]
REPORTED COAL NAMES: Upper Kittanning and Lower Freeport			WEATHERING: Very weathered [illegible] vert. ([illegible]-5' spacing); [illegible] vert. (5'-6' spacing)

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Soil		G	Lt bn																						
5.0	Sandstone		S	Lt gy bn																						Crossbedded. Plant fossils present. Coarse to very coarse grained.
6.0	Coal (Lower Freeport)		S	Bk	B				X			X	D	4.3	29.9	58.0	7.8	4.9	69.9	1.2	15.6	0.6	11960	1/2	2680	Numerous discontinuous partings. Rolls. Deep mined. For trace element analysis, see sample #410812'785224'2A.
15±	Claystone			Gy bk																						Rootworked.
	Cover																									May contain thin coal or carbonaceous shale.
2.0	Sandstone		S	Lt gy bn																						Rootworked. Fine grained.
3.6	Fissile sandstone		S	Md lt gy																						Very fine grained. Plant fragments present.
3.0	Sandstone		S	Md gy																						Plant fragments present. Fine grained.
15.0	Sandy siltstone		G	Gy bk Lt bn																						Contains sand lenses (up to 6" thick). Abundant plant fragments. Grades to sandstone at top.
12.0	Claystone			Ol gy Gy bk																						Thin olive-gray clay laminae increase in thickness upwards (up to ½" thick at top). Rare siderite nodules.

SITE/STATION NO. 64-46 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

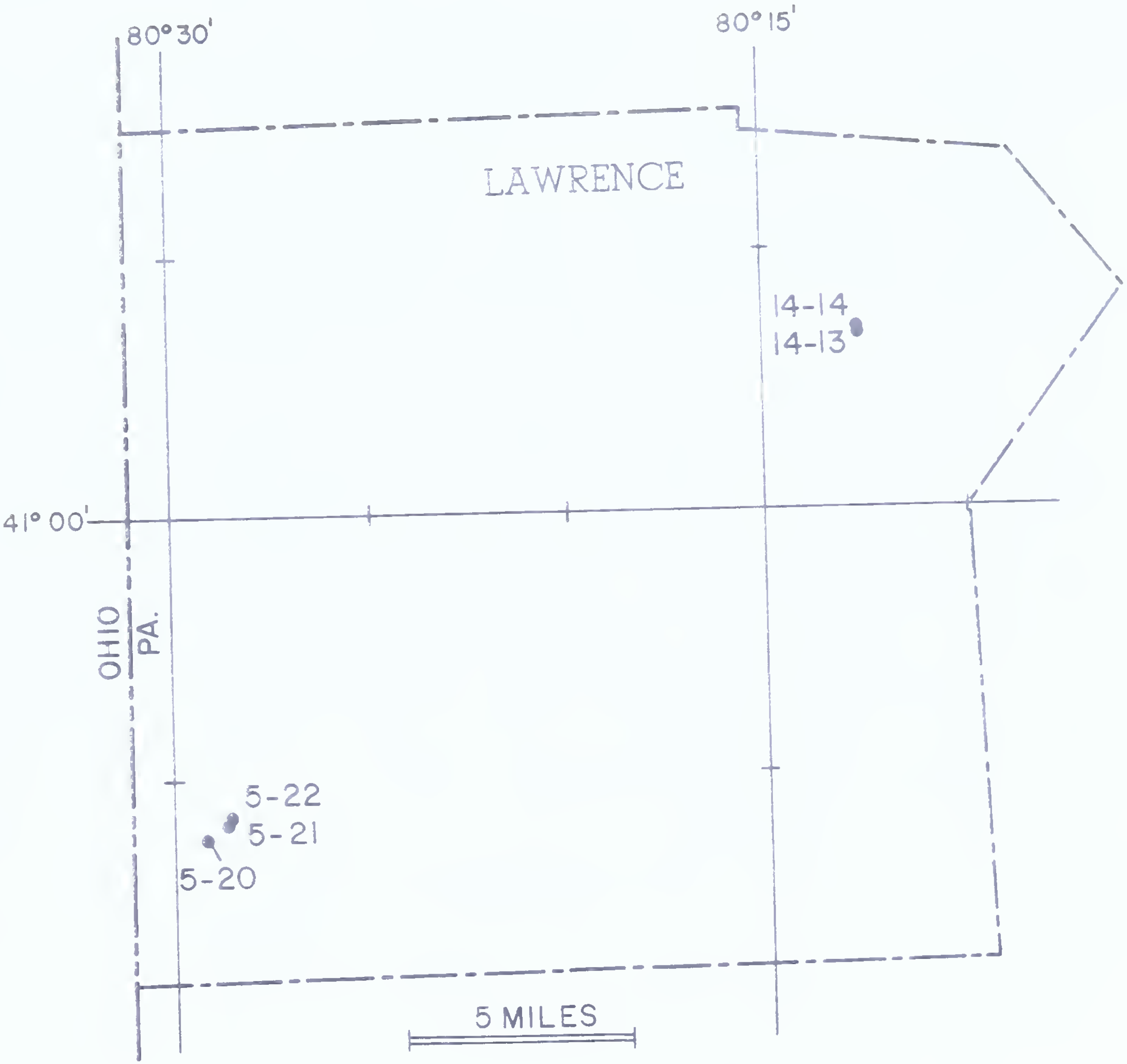
STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUN-DANCE				THICK-NESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2.4 (Upper Kittanning)	Coal	0.5	S	Bk	B		X	X			X	X	M	1.0	34.6	51.7	12.7	4.9	72.2	1.2	5.6	3.4	13050	7	2030	Pyrite bands (1/8" maximum thickness). For trace element analysis, see sample #410812/785224/1A (this includes underlying 0.1' coal).
	Coal	0.1	G	Bk	B				X			X	D													Scattered pyrite blebs.
	Coal	1.8	G	Bk	B		X				X	X	MB	0.9	35.1	50.1	13.9	4.9	70.3	1.1	5.6	4.2	12880	7½	1960	Pyrite near bottom. For trace element analysis, see sample #410812/785224/1A.
	Claystone		S	Gy bk																						

SITE/STATION NO.: 65-27	COUNTY: Jefferson		COAL SAMPLE NO(S).: 405710/784826, 405710/784828
COMPANY: P & N Coal Co.	LAT. °N: 40°57'10"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 78°48'26"	TWP.: Gaskill	
PERMIT: 32-56	GEOLOGIST: Hempel	15' QUADRANGLE: Punxsutawney	JOINTING: Coal cleat: N55W; N50W; N65W (all vert.)
SAMPLING METHOD: Channel	DATE: Summer 1975	7 1/2' QUADRANGLE: McGees Mills	(face); N39E, N30E, N25E (all vert.) (butt). Strike and
REPORTED COAL NAMES: Middle Kittanning			WEATHERING: Fresh dip on coal: N51E, 4NW.

STRATIGRAPHIC DATA					COAL								COAL ANALYSIS												
						VITRAIN							PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS															
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mad-bright, mid-lustrous, mad-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.0+	Sandstone			Gy bn																						Jointing: N11W, vert.; N15W, vert.; N50W, vert.; N70W, vert. (5' spacing).
5.0±	Sand-silt laminite		S	Lt gy																						Crossbedded.
2.0	Silty sandstone		S	Lt gy																						Crossbedded. Few plant fragments.
0.2	Silt-clay laminite		S	Gy bn																						Plant fragments rare.
0.3	Siltstone		G	Md dk gy																						
2.1	Coal		S	Bk	B	X					X		B	2.5	31.4	60.6	5.5	5.1	79.7	1.4	7.3	1.0	14110	8½	2570	Very splintery.
														2.5	29.2	61.8	6.5	5.0	79.2	1.4	6.7	1.2	14040	8	2430	Sample #405710/784828.
	Claystone		S	Lt md gy																						Rootworked.

SITE/STATION NO. 65-28	COUNTY: Jefferson		COAL SAMPLE NO(S).: 405503/784910/2
COMPANY: John Kann Coal Co.	LAT. °N: 40°55'03"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 78°49'10"	TWP.: Gaskill	
PERMIT: 621-6	GEOLOGIST: Glover	15' QUADRANGLE: Punxsutawney	JOINTING:
SAMPLING METHOD: Channel	DATE: 6-10-76	7 1/2' QUADRANGLE: McGees Mills	
REPORTED COAL NAMES: Upper Kittanning and Lower Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.3	Coal crop (Lower Freeport)		S	Bk																						At west end of strip this coal becomes 2'+ with sandstone cover.
3.0	Claystone		S																							Freshwater limestone nodule found.
7.0	Sandstone		S	Lt ol gy																						Fine to very fine grained.
9.0	Clay shale		S																							
0.5	Carbonaceous clay shale		S	Bk																						Blocky fracture.
1.4	Silty claystone		S	Md gy																						Rootworked. Stigmaria. Slickensides.
1.0	Coal		S	Bk	B			X				X	MD													
12	Sand-silt laminite		G	Md-lt-gy sand Md-dk-gy silt																						Very fine grained sand. Plant material. Mica on bedding plane.
3.8	Silt shale		S	Md gy																						Plant leaves and fragments common.
2.6	Coal (Upper Kittanning)		S	Bk	B		X				X	X	B	3.6	29.3	59.5	7.6	5.3	76.5	1.3	7.5	1.8	13720	8½	2385	Pyrite lenses common. Thin shale partings at top.
0.25+	Claystone			Md lt gy to md dk gy																						Rootworked. Stigmaria. Soft and plastic.


80°30'
80°15'
LAWRENCE
14-14
14-13
41°00'
OHIO
PA.
5-22
5-21
5-20
5 MILES

SITE/STATION NO. 5-20		COUNTY: Lawrence		COAL SAMPLE NO(S).: 405356/802912/4, 405356/802912/6, 405356/802912/8	
COMPANY: Yoder & Quear Coal		LAT. °N: 40°53'56"	ELEV. (base lower coal): 1067'		
MINE: Strip mine		LONG. °W: 80°29'12"	TWP.: Little Beaver		
PERMIT: 40-69		GEOLOGIST: Gabler	15' QUADRANGLE: New Castle	JOINTING: Coal cleat: N70W, 88SW; N20E, vert. Strike and dip of coal: N20E, 5W.	
SAMPLING METHOD: Channel		DATE: 7-8-75	7 1/2' QUADRANGLE: Bessemer		
REPORTED COAL NAMES: Lower Kittanning				WEATHERING: Weathered	

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2.0+	Overburden			Lt bn																						
			G																							
~30.0	Clay shale			Dk gy to gy bk																						
			S																							
2.6	Coal	0.2		Bk	B			X			X	X	M	2.4	38.4	46.1	13.1	5.3	69.4	1.3	8.0	2.9	12460	5½	2690	
			S																							
	Bone coal	0.1		Bk																						
			G																							
	Coal	0.4		Bk	B			X			X		MB	4.1	36.2	47.1	12.6	5.2	68.7	1.3	9.6	2.6	12310	6½	2550	
			S																							
	Clay shale	0.8		Md dk gy to dk gy																						
			S																							
	Coal	1.1		Bk	B				X			X	MB	4.2	38.9	46.1	10.8	5.2	70.0	1.3	9.6	3.1	12590	4½	2190	
			S																							
~10.0	Silty clay shale			Bn gy																						
			G																							
1.0	Silty claystone			Bn gy																						
			G																							
~18.0	Silty clay shale			Md dk gy to dk gy																						

SITE/STATION NO. 5-21	COUNTY: Lawrence		COAL SAMPLE NO(S).: 405409/802842/2, 405409/802842/4
COMPANY: R. A. Veon	LAT. °N: 40°54'09"	ELEV. (base lower coal): 1076'	
MINE: Strip mine	LONG. °W: 80°28'42"	TWP.: Little Beaver	
PERMIT: 40-17	GEOLOGIST: Gabler	15' QUADRANGLE: New Castle	JOINTING: Coal cleat: N40W, vert.; N50E, 88W. Strike and
SAMPLING METHOD: Channel	DATE: 7-8-75	7 1/2' QUADRANGLE: Bessemer	dip on top of coal: N6W, 3SW.
REPORTED COAL NAMES: Lower Kittanning			WEATHERING: Fresh-weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)									
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncan.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
~30+	Silty clay shale			Bn gy																						
0.2	Claystone			Dk gy to md dk gy																						
2.15	Coal	0.9	S	Bk	B				X			X	M	2.3	36.0	47.7	14.0	5.0	68.4	1.5	7.3	3.8	12310	6	2080	
	Clay shale	0.05	S	Bk to gy bk																						Plant stems common.
	Coal	1.2	S	Bk	B				X			X	MB	2.9	36.8	55.0	5.3	5.4	76.2	1.6	9.9	1.6	13560	7½	2130	
0.2	Claystone		S	Dk gy to md dk gy																						

SITE/STATION NO.	5-22	COUNTY:	Lawrence	COAL SAMPLE NO(S).:	405413/802840/7, 405413/802840/9, 405413/802840/11, 405413/802840/13
COMPANY:	R. A. Veon	LAT. °N: 40°54'13"	ELEV. (base lower coal): 1107'		
MINE:	Strip mine	LONG. °W: 80°28'40"	TWP.: Little Beaver		
PERMIT:	40-17	GEOLOGIST: Gabler	15' QUADRANGLE: New Castle	JOINTING:	Coal cleat: N40W, 85SW; N50E, vert. Strike and dip on coal: N50E, 5SE.
SAMPLING METHOD:	Channel	DATE: 7-8-75	7 1/2' QUADRANGLE: Bessemer		
REPORTED COAL NAMES:	Lower Kittanning			WEATHERING:	Fresh

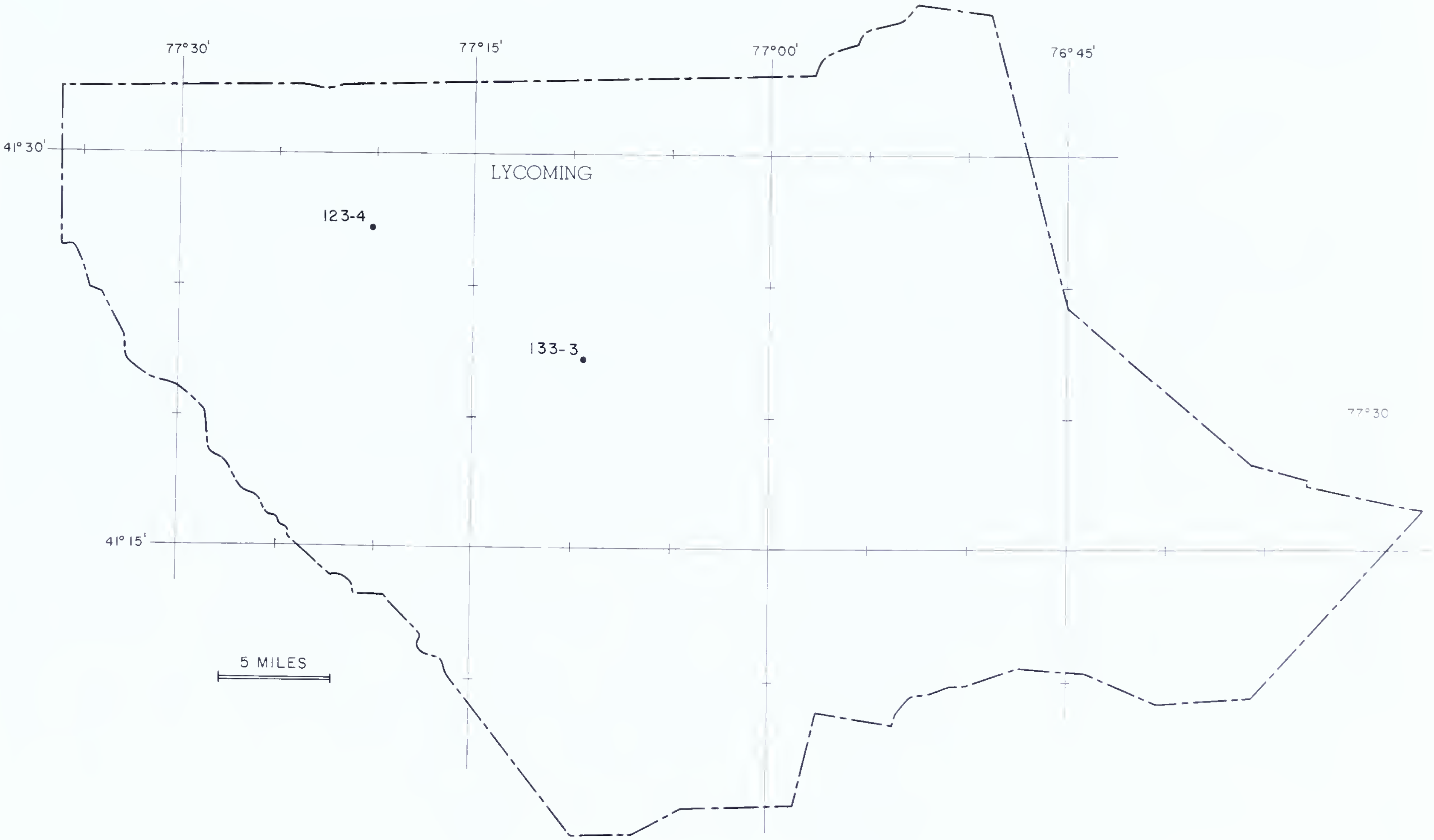
STRATIGRAPHIC DATA					COAL									COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)									
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
~30	Clay shale			Gy bk to md dk gy																						Siderite nodules common (1"-5").
2.7	Coal	0.5		Bk	B		X			X	X	X	MB	3.3	29.6	38.1	29.0	4.3	53.5	1.1	9.7	2.4	9630	4	2470	
	Claystone	0.1	S	Gy gn																						
	Coal	0.2	S	Bk	B				X		X	X	M	3.0	29.0	35.3	37.7	4.0	49.4	1.0	10.1	2.8	8970	2½	2530	
	Claystone	0.1	S	Md dk gy to md gy																						
	Coal	0.6	S	Bk	B				X			X	M	2.5	38.2	50.4	8.9	5.4	73.0	1.4	8.8	2.5	13130	7	2380	
	Clay shale	0.1	S	Bk to gy bk																						
	Coal	1.1	S	Bk	B				X		X	X	M	3.3	29.2	39.5	28.0	4.4	55.4	1.0	8.9	2.3	9760	4	2480	

SITE / STATION NO. 14-13	COUNTY: Lawrence			COAL SAMPLE NO(S).: 410312/801238 2A, 4[illegible]
COMPANY: Perry-Ross	LAT. °N: 41^{0}03'12"	ELEV. (base lower coal): 1231'		
MINE: Strip mine	LONG. °W: 80^{0}12'38"	TWP.: Washington		JOINTING: Coal cleat: N34E, 81SW; N32E, 65W; N22E, vert.
PERMIT: 72-15	GEOLOGIST: Reardon	15' QUADRANGLE: Mercer		(>2" spacing); N39W, vert.; N68W, 87NE; N55W, vert. [illegible]
SAMPLING METHOD: Channel	DATE: 6-24-75	7 1/2' QUADRANGLE: Harlansburg		spacing). Strike and dip on coal: N51E, 2NW; N20E, [illegible]
REPORTED COAL NAMES: Lower Kittanning				WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
18.0+	Silty clay shale			Dk gy																						Jointing: N36E, vert.; N70W, 87NE; N35W, 80NE. Few siderite nodules in upper part.
1.6	Coal	1.0	S	Bk	B				X		X	X	D	2.7	37.9	46.8	12.6	5.1	69.9	1.5	9.8	1.1	12520	4	2910+	Streaks and lenses of pyrite common. Thin bed of shale (<1" thick) at base.
	Coal	0.6		Bk	B		X	X			X	X	MB	3.8	35.5	53.5	7.2	5.3	73.2	1.4	11.2	1.7	13030	5½	2520	Few pyrite lenses.
	Claystone		S	Gy bk																						Plant fossils.

SITE/STATION NO. 14-14	COUNTY: Lawrence		COAL SAMPLE NO(S).: 410314/801238/2A, 410314/801238/2B
COMPANY: Perry-Ross	LAT. °N: 41°03'14"	ELEV. (base lower coal): 1232'	
MINE: Strip mine	LONG. °W: 80°12'38"	TWP.: Washington	
PERMIT: 72-15	GEOLOGIST: Reardon	15' QUADRANGLE: Mercer	JOINTING: Coal cleat: N28E, 87SE; N29E, 89SE; N68W, 87SW;
SAMPLING METHOD: Channel	DATE: 6-24-75	7 1/2' QUADRANGLE: Harlansburg	N60W, 89SW (>2" spacing).
REPORTED COAL NAMES: Lower Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Silty clay shale			Dk gy																						Few siderite nodules at top of bed.
1.4	Coal	0.9	S	Bk	B				X		X	X	D	2.7	35.8	46.2	15.3	5.0	67.4	1.4	9.8	1.1	12090	4	2690	Thin (<1/8") band of shale at base.
	Coal	0.5		Bk	B			X	X		X	X	D	4.2	34.5	53.3	8.0	5.2	72.0	1.0	12.2	1.6	12860	5½	2530	
0.4+	Silty clay shale		S	Ol gy																						

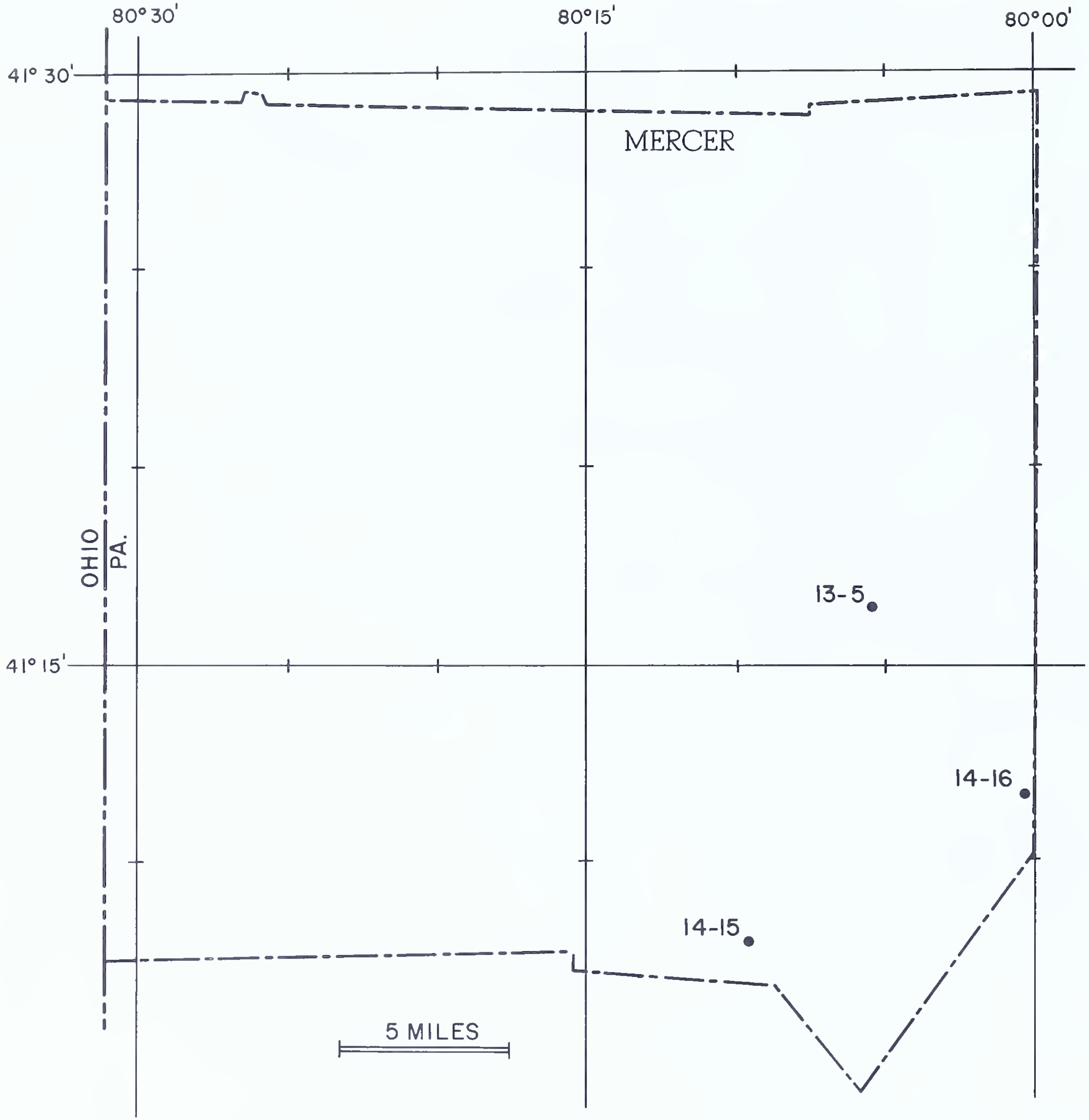

77°30'
77°15'
77°00'
76°45'
41°30'
LYCOMING
123-4
133-3
77°30
41°15'
5 MILES

SITE/STATION NO.	123-4	COUNTY:	Lycoming	COAL SAMPLE NO(S).:	412705/782017, 412704/782013
COMPANY:	Fisher Mining Co.	LAT. °N: 41°27'05"	ELEV. (base lower coal):		
MINE:	Strip mine	LONG. °W: 78°20'17"	TWP.: Pine		
PERMIT:	637-1	GEOLOGIST: Hempel	15' QUADRANGLE: Waterville	JOINTING:	
SAMPLING METHOD:	Channel	DATE: Summer 1975	7 1/2' QUADRANGLE: English Center		
REPORTED COAL NAMES:				WEATHERING:	Fresh

STRATIGRAPHIC DATA													COAL ANALYSIS														
					COAL								PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN ABUNDANCE				VITRAIN THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
25.0	Sandstone			Lt ol gy																						
10.0	Silty sandstone			Md ol gy																						
4±	Claystone			Dk gy																						½"-1" thick laminae of dark-olive-gray clay present. Few plant fragments.
2.9	Coal		S	Bk	B				X			X	MB	2.2 0.8	18.2 21.3	58.0 66.8	21.6 11.1	4.0 4.5	67.3 78.7	1.2 1.3	5.2 3.4	0.7 1.0	11680 13680	9 8½	2910+ 2910+	Sample #412704/782013.
0.5	Bony coal		S	Bk																						
2.0	Silty sandstone		S	Md gy																						Rootworked.
	Coal		S	Bk																						

SITE/STATION NO. 133-3	COUNTY: Lycoming			COAL SAMPLE NO(S).: 412209/780937/1, 412209/780937/3, 412209/780937/5
COMPANY: Paul Percival	LAT. °N: 41°22'09"	ELEV. (base lower coal):		
MINE: Strip mine	LONG. °W: 78°09'37"	TWP.: Cogan House		
PERMIT: 131-1	GEOLOGIST: Hempel	15' QUADRANGLE: Trout Run		JOINTING:
SAMPLING METHOD: Channel	DATE: Summer 1975	7 1/2' QUADRANGLE: Salladasburg		
REPORTED COAL NAMES: Bloss				WEATHERING: Weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
15.0	Sandstone			Lt ol																						Coarse grained. Massive.
3.1	Coal			Bk	B		X						B	1.4	17.1	67.9	13.6	3.9	74.9	1.2	5.7	0.7	12820	1	2910+	
10±	Claystone			Md gy																						
1.2	Coal			Bk	B			X					MB	1.2	13.5	51.9	33.4	3.1	57.7	0.9	4.5	0.4	9800	1	2910+	
10.0	Siltstone			Md gy																						Rootworked.
1.5	Coal			Bk	B			X					M	1.8	17.0	74.1	7.1	4.2	81.5	1.2	5.4	0.6	13850	½	2910+	


80° 30'
80° 15'
80° 00'
41° 30'
41° 15'
MERCER
OHIO
PA.
13-5
14-16
14-15
5 MILES

SITE/STATION NO. 13-5
COMPANY: Willowbrook
MINE: Strip mine
PERMIT: 130-6
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Brookville

COUNTY: Mercer
LAT °N: 41°16'38"
LONG. °W: 80°05'31"
GEOLOGIST: Reardon
DATE: 6-25-75

ELEV. (base lower coal): 1323'
TWP.: Worth
15' QUADRANGLE: Stoneboro
7 1/2' QUADRANGLE: Sandy Lake

COAL SAMPLE NO(S).: 411638/800531/2A, 411638/800531/2B, 411638/800531/2C
JOINTING: Coal cleat: N57W, 86NE; N55W, 89NE; N54W, vert. (>2" spacing); N46E, 87SE; N36E, vert.; N39E, 89SE. Strike and dip on coal: N9W, 2E; N25W, 4SE.
WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)									
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
14.0+	Claystone			Md dk gy																						Few siderite nodules and bands.
3.6	Coal	1.0		Bk	B				X		X	X	D	4.9	37.6	49.2	8.3	5.4	70.7	1.3	11.0	3.3	12700	4½	2070	Abundant bands of pyrite.
	Shaly coal	0.1		Bk																						
	Coal	1.8		Bk	B				X		X	X	M	4.1	42.0	46.4	7.5	5.4	71.0	1.3	9.4	5.4	12860	4½	2350	Abundant thin bands of pyrite (<1/32" thick). Thin shale partings at base.
	Coal	0.7		Bk	B			X	X		X	X	MB	7.4	36.3	48.3	8.0	5.4	68.7	1.3	13.0	3.6	12320	5	2180	Abundant streaks of pyrite.
0.1+	Claystone			Md dk gy																						

SITE/STATION NO. 14-15	COUNTY: Mercer		COAL SAMPLE NO(S).: 410801/800935/2A, 410801/800935/2B
COMPANY: Perry Ross	LAT. °N: 41°08'01"	ELEV. (base lower coal): 1264'	
MINE: Strip mine	LONG. °W: 80°09'35"	TWP.: Springfield	JOINTING: Coal cleat: N49W, 86NE; N56W, 86NE; N45W, 85NE
PERMIT: 72-12	GEOLOGIST: Reardon	15' QUADRANGLE: Mercer	(>2" spacing); N35E, 87NW; N50E, 81NW; N40E, 85NW (½"-2"
SAMPLING METHOD: Channel	DATE: 6-26-75	7 1/2' QUADRANGLE: Mercer	spacing). Strike and dip on coal: N85W, 1SE.
REPORTED COAL NAMES: Brookville			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
12+	Silt-clay laminite			Md dk gy																						
2.7	Coal	1.2	S	Bk	B			X	X		X	X	MD	4.3	34.4	57.4	3.9	5.4	77.2	1.7	1.7	0.5	13630	4	2910+	Very thin band of shale at base.
	Coal	1.5		Bk	B			X			X	X	D	4.4	34.7	54.0	6.9	5.2	74.3	1.5	11.3	0.8	13080	3½	2910+	Small streaks of pyrite and shale common.
0.6	Silt-clay shale		S	Gy bk																						Plant fossils.

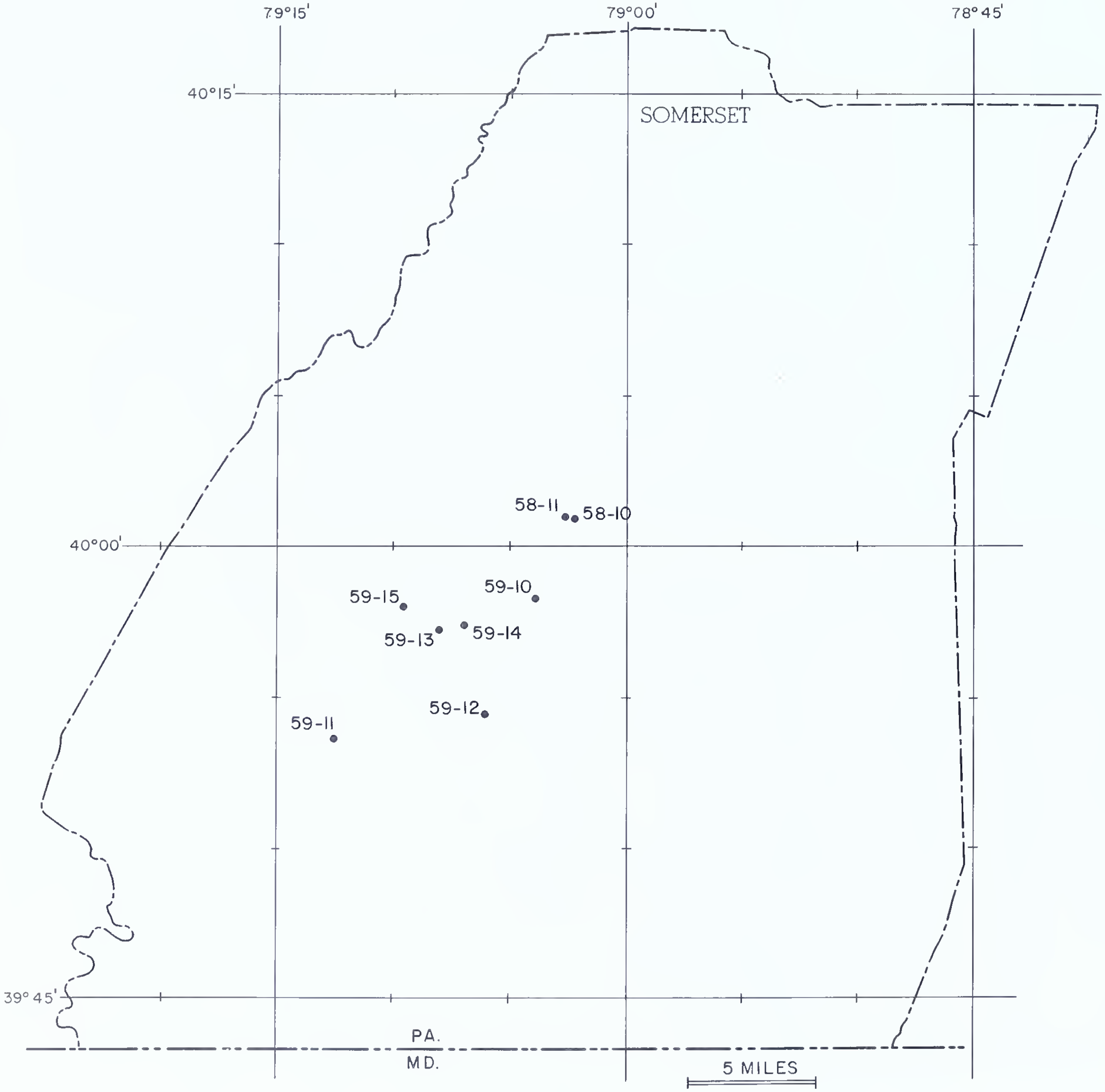
SITE/STATION NO. 14-16
COMPANY: H & D Coal Co.
MINE: Strip mine
PERMIT: 1177-1
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Brookville

COUNTY: Mercer
LAT. °N: 41°11'53"
LONG. °W: 80°00'21"
GEOLOGIST: Reardon
DATE: 6-26-75

ELEV. (base lower coal): 1323'
TWP.: Pine
15' QUADRANGLE: Mercer
7 1/2' QUADRANGLE: Grove City

COAL SAMPLE NO(S).: 411153/800021/2A, 411153/800021/2B
JOINTING: Coal cleat: N59W, 87SW; N65W, 89SW; N62W, 85SW (½"-2" spacing); N37E, 86SE; N26E, vert.; N32E, vert. (½"-2" spacing). Strike and dip on coal: N59W, 1SW; N68W, 1SW.
WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Till																									Sandy clay till.
1.1	Coal		S	Bk																						Not persistent. Goes to carbonaceous black shale in places.
3.5	Claystone		S	Bn gy																						Plant fossils. Micaceous. Rootworked.
9.8	Sandstone		U	Md gy																						Micaceous. Plant fossils common (mainly stems). Rootworked.
2.1	Coal	1.1	U	Bk	B				X			X	D	2.5	35.9	44.4	17.2	4.7	61.9	1.0	5.3	9.9	11440	4	2100	Bony layer at bottom. Bands of pyrite abundant. Becomes shaly at top.
	Coal	1.0		Bk	B			X	X		X	X	D	3.0	41.6	47.0	8.4	5.4	71.8	1.4	8.3	4.7	12980	4	2130	Streaks and lenses of pyrite abundant.
0.2	Claystone		S	Dk gy																						Plant fossils.


79°15'
79°00'
78°45'
40°15'
SOMERSET
58-11
58-10
40°00'
59-15
59-10
59-13
59-14
59-12
59-11
39° 45'
PA.
MD.
5 MILES

SITE/STATION NO. 58-10
COMPANY: P.B.S. Coal Co.
MINE: Strip mine
PERMIT: 222-22
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Lower Kittanning

COUNTY: Somerset
LAT. °N: 40°01'03"
LONG. °W: 79°02'46"
GEOLOGIST: Gabler
DATE: 7-2-75

ELEV. (base lower coal): 1976'
TWP.: Somerset
15' QUADRANGLE: Somerset
7 1/2' QUADRANGLE: Somerset

COAL SAMPLE NO(S).: 400103/790246/3, 400103/790246/5, 400103/790246/7, 400103/790246/9
JOINTING: Coal cleat: N60E, 87NW; N20W, vert. Strike and dip of silt-clay laminite: horizontal.
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
~10	Overburden--clay shale			Gy bk																						
~0.5	Coal			Bk																						
~11	Sandstone			Gy bk																						
1.5	Silt-clay laminite			Gy bk																						
4.3	Coal	0.5		Bk	N									1.0	13.8	63.6	21.6	3.4	69.6	0.9	4.0	0.5	11750	1	2910+	
	Claystone	0.2		Gy bk to bk																						
	Coal	0.15		Bk	B		X			X			MB	1.6	15.8	55.5	27.1	3.6	61.9	1.0	4.6	1.8	10700	5	2910+	
	Bone coal	0.05	S	Bk																						
	Coal	1.65	S	Bk	B					X		X	MB	1.8	16.7	72.5	9.0	4.2	78.7	1.3	4.3	2.5	13710	7½	2180	Few pyrite lenses (1 mm x 5 mm).
	Bone coal	0.05	S	Bk																						
	Coal	1.3	S	Bk	B			X		X		X	MB	1.5	18.1	66.3	14.1	4.3	74.2	1.2	3.8	2.4	12950	9	2540	Few pyrite lenses (2 mm x 8 mm).
	Claystone	0.3	S	Dk gy to gy bk																						
	Coal	0.1	S	Bk																						

SITE/STATION NO. 58-11
COMPANY: P.B.S. Coal Co.
MINE: Strip mine
PERMIT: 222-22
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Lower Kittanning

COUNTY: Somerset
LAT. °N: 40°01'05"
LONG. °W: 79°03'02"
GEOLOGIST: Gabler
DATE: 7-2-75

ELEV. (base lower coal): 2094'
TWP.: Somerset
15' QUADRANGLE: Somerset
7 1/2' QUADRANGLE: Somerset

COAL SAMPLE NO(S).: 400105/790302/2, 400105/790302/4, 400105/790302/7, 400105/790302/9
JOINTING: Coal cleat: N30W, vert.; N60E, vert. Joint in sandstone: N50W, vert. Strike and dip on sandstone: N85E, 3NW.
WEATHERING: Fresh to weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUN-DANCE				THICK-NESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S= Sharp, G= Gradational, U= Uncon)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60 %	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
~4+	Overburden		G	Lt bn																						
~1.5	Sandstone		G	Lt bn																						
~15	Sandy clay shale		S	Bn gy																						
1.55	Coal	0.5	S	Bk	B		X				X	X	MB	1.8	16.5	58.9	22.8	3.9	65.2	1.0	4.1	3.0	11380	6½	2520	
	Carbonaceous clay shale	0.05	S	Gy bk to bk																						Few fossil stems.
	Coal	1.0	S	Bk	B		X				X	X	MB	2.4	16.7	63.7	17.2	4.1	70.5	1.1	4.1	3.0	12240	6½	2410	
3.0	Clay shale		G	Md gy																						
7.0	Sandstone		S	Md gy																						
1.85	Coal	0.4	S	Bk	B				X			X	M	5.0	17.5	69.1	8.4	4.6	76.9	1.3	6.6	2.2	13330	4½	2150	Pyrite lenses common (5 mm x 10 mm).
	Claystone	0.05	S	Md dk gy to dk gy																						
	Coal	1.4	S	Bk	B				X			X	M	9.2	17.0	65.6	8.2	5.0	72.6	1.3	11.4	1.5	12540	7	2560	Few pyrite lenses (3 mm x 20 mm).
0.1	Claystone			Md dk gy to dk gy																						Plant fossils common.

SITE/STATION NO. 59-10
COMPANY: B B L Enterprises
MINE: Beeghly #1 strip
PERMIT: 1143-1
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Upper Freeport

COUNTY Somerset
LAT °N: 39°58'30"
LONG. °W: 79°04'24"
GEOLOGIST: Edmunds
DATE: 5-11-76

ELEV. (base lower coal): ~2050'
TWP.: Milford
15' QUADRANGLE: Meyersdale
7 1/2' QUADRANGLE: Murdock

COAL SAMPLE NO(S).: 395830/790424/2
JOINTING: Coal: N47W, vert.; N34E, vert. Claystone: N26E, vert.; N74W, vert.
WEATHERING: Slightly weathered

STRATIGRAPHIC DATA														COAL ANALYSIS											
					COAL									PROXIMATE (%)				ULTIMATE (%)							
						VITRAIN																			
						ABUN-DANCE				THICK-NESS															
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Cloroin-Duroin Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
12+	Silty clay shale			Lt ol gy																						
			S																							
4-6	Clayey, silty sandstone			Md lt gy to dusky yl																						
			G																							
7	Clay shale and silty clay shale			Lt ol gy																						
			S																							
0.1-0.3	Carbonaceous clay shale			Gy bk to bk																						Common plant fragments.
			S																							
3	Claystone			Ol gy to dk gy																						
			S																							
8	Silty claystone, claystone, and clay shale			Ol gy																						Two or three 0.5' siltstones in top 2 feet. Common plant fragments.
			G																							
0.3-0.5	Claystone			Gy bk																						Slickensides. Abundant plant fragments.
			S																							
1.7	Coal			Bk	B		X				X	X	M	3.1	18.4	68.8	9.7	4.6	76.3	1.3	4.9	3.2	13550	9	2035	
			S																							
	Claystone																									Top surface exposed only.

SITE/STATION NO. 59-11	COUNTY: Somerset		COAL SAMPLE NO(S).: 395345/791302/1, 395345/791302/3, 395350/791309/3
COMPANY: Svonavec Coal Co.	LAT. °N: 39°53'45"	ELEV. (base lower coal): ~2020'	
MINE: Strip mine	LONG. °W: 79°13'02"	TWP.: Upper Turkeyfoot	
PERMIT: 553-12	GEOLOGIST: Edmunds	15' QUADRANGLE: Meyersdale	JOINTING:
SAMPLING METHOD: Channel	DATE: 5-12-76	7 1/2' QUADRANGLE: Rockwood	
REPORTED COAL NAMES: Reported as Bakerstown, but probably unnamed local coal			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
8±	Claystone		?	Rd gy																						Not directly accessible.
20-25	Sandstone		?	Lt gy																						Not directly accessible.
5-10	Cover		?																							May be shale or thin-bedded sandstone.
0-1±	Coal (reported)		?	Bk																						Reported, but not accessible.
5	Claystone and silty claystone		?	Lt gy to md lt gy																						Limestone nodules.
45	Siltstone to silt shale		G	Var.-md dk gy to lt gy																						Large-scale slumps. Foreset beds. Contorted and irregular bedding. Plant fragments and leaves. Siderite bands to 0.5'. Probable channel or oxbow plug.
			S											3.5	20.3	65.5	10.7	4.6	75.8	1.4	3.9	3.6	13480	9	2110	Local channel-fill coal. Clay dikes to 3' wide. Friable. Pyrite lenses. Cut by slips in overlying unit.
0-8.9	Coal			Bk	B				X			X	MB	4.2	19.8	67.6	8.4	4.8	75.9	1.5	5.9	3.5	13440	9	2105	Sample #395350/791309/3.
4-6	Claystone and clay shale		S	Md gy to lt yl gy																						Plant fragments.
0-4.0	Coal		S	Bk	B			X	X			X	MB	3.6	19.6	68.2	8.6	4.7	76.2	1.5	5.3	3.7	13500	9	2055	Local channel-fill coal. Clay lenses. Clay dikes. Friable. Pyrite lenses. Sample #395345/791302/1.

SITE/STATION NO. 59-12	COUNTY: Somerset		COAL SAMPLE NO(S).: 395437/790632/1A, 395437/790632/1B
COMPANY: Unknown	LAT. °N: 39°54'37"	ELEV. (base lower coal): ~2180'	
MINE: Unknown stripping	LONG. °W: 79°06'32"	TWP.: Black	
PERMIT: Unknown	GEOLOGIST: Edmunds	15' QUADRANGLE: Meyersdale	JOINTING:
SAMPLING METHOD: Channel	DATE: 5-13-76	7 1/2' QUADRANGLE: Murdock	
REPORTED COAL NAMES: Probable Lower Kittanning			WEATHERING: Weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Coal blossom		?	Bk																						
3±	Claystone		G	Md lt gy to ol gy																						
3	Silt shale		S	Md dk gy																						Plant fragments.
3-6	Sandstone		S,U?	Lt gy																						Crossbedded. Shale clasts. Plant fragments. Silica cement Fine to medium grained.
23-29	Sand-silt laminite		G	Lt gy Md dk gy, dk gy, and ol gy																						Parallel laminations except where distorted by load casts and flame structures. Frequent carbonaceous laminae. Some sandstones to 0.1'.
1.0	Sand-silt laminite shale		G	Md gy Md dk gy																						Abundant plant leaves. Locally carbonaceous.
1.0	Silt shale		S	Md gy																						Abundant plant leaves.
3.0	Coal		S	Bk	B			X				X	M-MB	3.1	18.1	66.6	12.2	4.5	74.1	1.3	4.9	3.0	13070	9	2280	Eight to twelve thin, discontinuous partings.
0.7	Claystone		S	Ol gy																						Plant fragments.
2.4	Coal			Bk	B				X			X	M	2.4	17.3	61.1	19.2	4.2	67.0	1.2	4.4	4.0	11910	9	2515	0-0.1' claystone parting 0.5' above base. Some pyrite lenses.

SITE/STATION NO. 59-13	COUNTY: Somerset		COAL SAMPLE NO(S).: 395719/790841/3
COMPANY: Fetterolf Coal Co.	LAT. °N: 39°57'19"	ELEV. (base lower coal): ~2020'	
MINE: Strip mine	LONG. °W: 79°08'41"	TWP.: Milford	
PERMIT: 216-39	GEOLOGIST: Edmunds	15' QUADRANGLE: Meyersdale	JOINTING: Silty sandstone: N33E, N3E (curved); N44W (curved).
SAMPLING METHOD: Channel	DATE: 5-13-76	7 1/2' QUADRANGLE: Rockwood	
REPORTED COAL NAMES: Reported as Upper Freeport (splits)			WEATHERING: Fresh

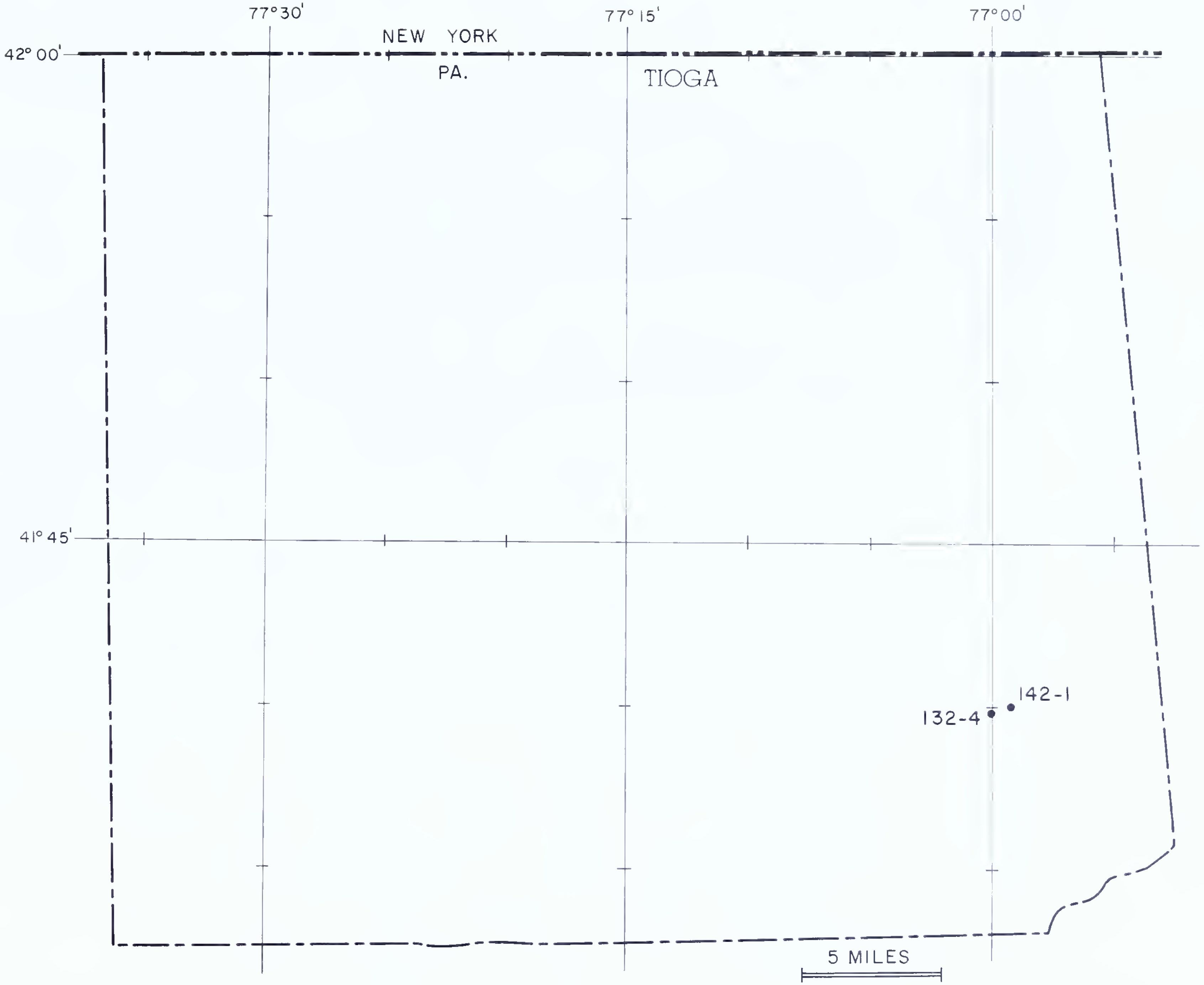
STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5mm	2-5mm	1/2-2mm	Grain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0-1.0±	Coal (reported)			Bk																						Reported, but not seen.
5±	Claystone(?)		?	?																						Not accessible.
22±	Silty sandstone		?	Md lt gy to md gy																						Not directly accessible.
2.5	Claystone to clay shale		S	Md gy																						Common plant impressions.
9.5	Silty sandstone		G	Md lt gy to md gy																						Parallel bedded. Few plant fragments.
2.0	Sand-silt laminite shale		G	Md dk gy Lt gy																						Mostly parallel laminae, some flaser laminae. Common plant fragments and leaves.
2.5	Coal	0.5	S	Bk	B				X			X	MD	2.9	18.3	66.9	11.9	4.6	75.1	1.3	6.9	0.2	13280	9	2610	
	Coal	2.0	G	Bk	B		X			X	X	X	M													
10	Sand-silt laminite		S	Md gy Md lt gy																						Mostly parallel laminae, some flaser and wavy laminae. Plant fragments and leaves.
5+	Cover		?																							
2.8	Coal (reported)		?																							Mined, but temporarily not exposed.

SITE/STATION NO. 59-14	COUNTY: Somerset		COAL SAMPLE NO(S).: 395736/790737/2, 395733/790733/4
COMPANY: Metco Mining & Minerals Co.	LAT °N: 39°57'33"	ELEV. (base lower coal): ~2040'	
MINE: Strip mine	LONG. °W: 79°07'33"	TWP.: Milford	
PERMIT: 1312-1	GEOLOGIST: Edmunds	15' QUADRANGLE: Meyersdale	JOINTING: Sand-silt laminite: N22E, 64SE; N42E; N23W.
SAMPLING METHOD: Channel	DATE: 5-11-76	7 1/2' QUADRANGLE: Rockwood	
REPORTED COAL NAMES: Upper Freeport (2 splits)			WEATHERING: Fresh

STRATIGRAPHIC DATA															COAL ANALYSIS													
					COAL									PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS	
15+	Clayey siltstone to clayey silt shale			Md gy																						Common plant fragments.	
			S																								
1.8 to 2.0	Coal			Bk	B		X				X	X	MB	2.1	17.9	68.2	11.8	4.5	76.0	1.3	4.6	1.8	13400	9	2625		
			S																								
12	Interbedded sand-silt laminite (80%) and sandstone (20%)			Md lt gy and md dk gy																							
			G																								
1	Claystone			Md dk gy																						Few plant fragments. Hard.	
			S																								
1.8	Coal			Bk	B		X					X	MB	2.8	17.0	63.1	17.1	4.3	71.0	1.2	5.2	1.2	12500	9	2800+	Sample =395736/790737/2.	
			S																								
	Claystone			Dk gy																						Top surface only exposed.	

SITE/STATION NO.	59-15	COUNTY:	Somerset		COAL SAMPLE NO(S).: 395805/791006/2A, 395805/791006/2B
COMPANY:	Doraville Enterprises	LAT. °N:	39°58'05"	ELEV. (base lower coal): ~2040'	
MINE:	Strip mine	LONG. °W:	79°10'06"	TWP.: Milford	
PERMIT:	670-3	GEOLOGIST:	Edmunds	15' QUADRANGLE: Meyersdale	JOINTING: Silt shale: N24E; N65W.
SAMPLING METHOD:	Channel	DATE:	5-11-76	7 1/2' QUADRANGLE: Rockwood	
REPORTED COAL NAMES:	Upper Freeport				WEATHERING: Fresh

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded (B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
25+	Mostly sandstone(?)			Ol gy to lt ol gy																						Not directly accessible. Badly weathered. Thin bedded.
2 - 4	Sandstone		?	Md lt gy																						1-2' beds.
11	Siltstone or silt shale to sand-silt laminite		G	Md gy to md gy and lt gy																						Few plant fragments.
2.6	Clay shale		G	Dk gy																						Abundant plant fragments and leaves.
8	Silt shale		G	Md gy to md dk gy																						Abundant plant leaves, stems, fragments.
2.9	Coal	2.0	S	Bk	B		X				X	X	MB	2.0	21.3	69.0	7.7	4.8	79.2	1.4	5.4	1.5	14100	9	2560	Splintery fracture.
	Claystone	0.2	S	Ol gy																						Pyritic. Hard.
	Coal	0.7	S	Bk	B			X				X	MB	2.8	21.6	60.5	15.1	4.5	71.0	1.2	4.3	3.9	12610	9	2195	
	Claystone		S																							Top surface exposed only.

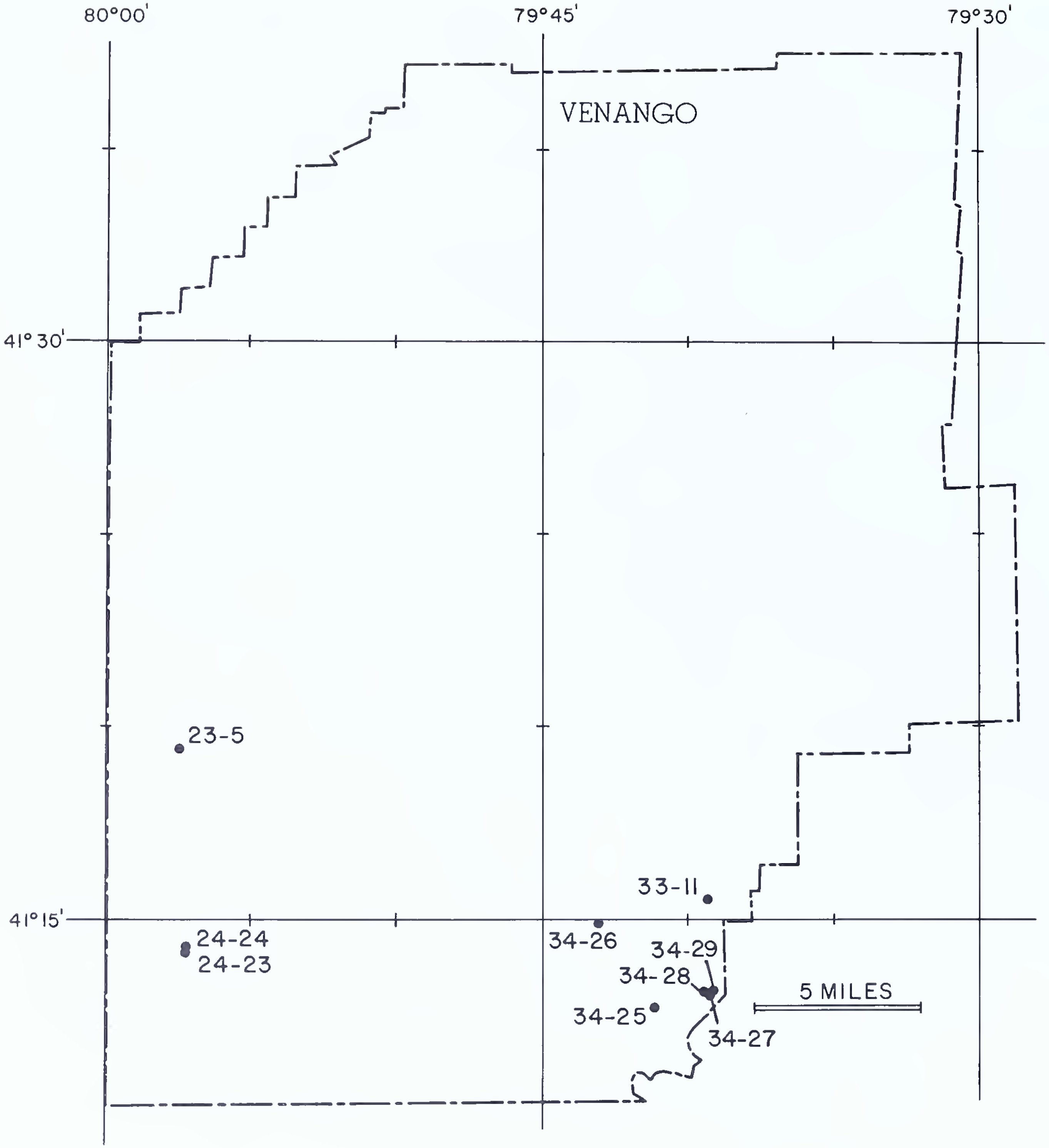

77°30'
77°15'
77°00'
42°00'
41°45'
NEW YORK
PA.
TIOGA
142-1
132-4
5 MILES

SITE/STATION NO. 132-4
COMPANY: Jones & Brague Mining Co.
MINE: Strip mine
PERMIT: 7-11
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Cannel and Morgan Complex
COUNTY: Tioga
LAT. °N: 41°40'01"
LONG. °W: 77°00'01"
GEOLOGIST: Hempel
DATE: Summer 1975
ELEV. (base lower coal): 1800'
TWP.: Ward
15' QUADRANGLE: Blossburg
7 1/2' QUADRANGLE: Blossburg
COAL SAMPLE NO(S).: 414001/770001/2A, 2B, 2C, 4, 6; 413956/770003/2A, 2B, 2C, 4
JOINTING: Coal cleat: N55E, vert.; N50E, vert. (face); N15W, vert.; N21W, vert. (butt). Strike and dip on cannel coal: N40W, 12SE.
WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded(B),Non-Bonded (N),or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2.5	Sandstone		S	Lt ol gy																						
1.5 (Morgan)	Coal		S	Bk	B			X					B	1.1	22.3	66.5	10.1	4.4	78.9	1.2	4.0	1.4	13750	8½	2910+	
4.0	Silty sandstone		S	Lt gy																						Rootworked.
2.1 (Morgan)	Coal		S	Bk	B		X						B	1.2	20.9	55.4	22.5	4.0	67.2	1.1	4.5	0.7	11640	8½	2910+	Peacock luster.
														1.3	20.5	71.3	6.9	4.6	82.4	1.3	2.7	2.1	14300	9	2910+	Sample #413956/770003/4.
5.0	Silty claystone		S	Dk gy																						Rootworked.
5.4 (Cannel)	Coal	1.9	S	Bk	B			X					MB	1.8	19.4	71.8	7.0	4.7	82.2	1.5	4.1	0.5	14260	9	2910+	
														1.9	17.5	71.4	9.2	4.5	79.6	1.4	4.8	0.5	13850	9	2910+	Sample #413956/770003/2C.
	Silty bone	2.5	S	Bk	B				X				D	0.6	10.9	21.3	67.2	1.9	24.6	0.4	5.6	0.3	4100	0	2910+	
														1.2	14.5	25.5	58.8	2.2	32.0	0.6	5.5	0.9	5360	0	2910+	Sample #413956/770003/2B.
	Coal	1.0	S	Bk	B			X					MB	1.6	18.7	68.5	11.2	4.4	78.5	1.2	3.3	1.4	13560	9	2910+	
														2.0	19.2	61.1	17.7	4.1	71.6	1.2	4.4	1.0	12390	9	2910+	Sample #413956/770003/2A.
2.0	Silt shale	2.0																								Rootworked.

SITE/STATION NO. 142-1	COUNTY: Tioga		COAL SAMPLE NO(S).: 414014/765912, 414007/76591
COMPANY: Jones & Brague Mining Co.	LAT °N: 41°40'14"	ELEV. (base lower coal): 1972'	
MINE: Strip mine	LONG. °W: 76°59'12"	TWP.: Ward	
PERMIT: 7-25	GEOLOGIST: Hempel	15' QUADRANGLE: Canton	JOINTING:
SAMPLING METHOD: Channel	DATE: Summer 1975	7 1/2' QUADRANGLE: Gleason	
REPORTED COAL NAMES: Morgan and Cannel			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Soil																									
3+	Sandstone (Morgan)		S	Lt ol																						Micaceous.
0.5	Coal		S	Bk	B			X					MB	3.4	18.0	69.4	9.2	4.3	78.6	1.2	6.2	0.5	13430	2½	2910+	Sample =414007/76591
5.0	Sandy siltstone		S	Lt to md gy																						Plant fragments abundant. Rootworked. Micaceous.
2.0	Clay shale		S	Dk gy																						Plant fragments abundant.
1.4	Coal (Cannel)		S	Bk	B			X				X	D	1.1	19.3	65.4	14.2	4.2	75.6	1.1	3.9	1.0	13100	7	2910+	Some pyrite. Sample =414014/765912.
2.0+	Silty claystone		S	Gy bk																						Rootworked.


80°00'
79°45'
79°30'
VENANGO
41°30'
41°15'
23-5
33-11
24-24
24-23
34-26
34-29
34-28
34-25
34-27
5 MILES

SITE/STATION NO. 23-5	COUNTY: Venango		COAL SAMPLE NO(S).: 411926/795738/2A, 411926/795738/2B
COMPANY: Mineral Hill Co.	LAT. °N: 41°19'26"	ELEV. (base lower coal): 1407'	
MINE: Strip mine	LONG. °W: 79°57'38"	TWP.: Mineral	JOINTING: Coal cleat: N39W, 86NE; N59W, vert.; N55W,
PERMIT: 515-4	GEOLOGIST: Reardon	15' QUADRANGLE: Franklin	89NE (>2" spacing); N28E, 70SE (½"-2" spacing). Strike
SAMPLING METHOD: Channel	DATE: 6-8-75	7 1/2' QUADRANGLE: Polk	and dip on coal: N81W, 2SW; N61W, 3SW.
REPORTED COAL NAMES: Clarion			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10.0+	Clay shale		S	Dk gy																						Few bands of siderite.
1.2	Carbonaceous clay shale		G	Gy bk																						Grades into shaly coal to coal in places. Plant fossils.
0.6	Claystone		G	Lt bl gy																						Plant fossils. Few lenses of carbonaceous shale.
0.4	Carbonaceous claystone			Gy bk																						Plant fossils.
2.1	Coal	1.1		Bk	B				X		X	X	D	2.8	34.0	50.5	12.7	4.7	68.3	1.3	9.5	3.5	12210	1½	2380	Abundant pyrite streaks. Shaly at top.
	Coal	1.0	G	Bk	D			X	X		X	X	D	2.9	37.2	41.7	18.2	4.6	62.1	1.2	9.8	4.1	11280	4½	2430	Bony at base. Pyrite lenses (up to 3" x 4" x 2').
	Carbonaceous clay shale			Gy bk																						Plant fossils.

SITE/STATION NO. 24-23	COUNTY: Venango			COAL SAMPLE NO(S).: 411410/795712/2A, 411410/795712/2B, 411410/795712/2C	
COMPANY: Penn Grove	LAT. °N: 41°14'10"	ELEV. (base lower coal): 1446'			
MINE: Strip mine	LONG. °W: 79°57'12"	TWP.: Irwin		JOINTING: Coal cleat: N62W, 86SW; N49W, 89NE; N56W, 86NE (½"-2" spacing); N79E, vert.; N46E, 85SE (<½" spacing).	
PERMIT: 74-16	GEOLOGIST: Reardon	15' QUADRANGLE: Hilliards			
SAMPLING METHOD: Channel	DATE: 7-8-75	7 1/2' QUADRANGLE: Barkeyville		Strike and dip on coal: N20W, 2N; N64E, 5NW.	
REPORTED COAL NAMES: Brookville				WEATHERING: Fresh	

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Bonded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Claroin-Duroin Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
16+	Sandstone			Lt gy																						Jointing: N46E, 87SE; N38W, 80SW. Plant fossils common. Contains streaks of vitrain.
2.9	Coal	1.3	U	Bk	B				X		X	X	D	2.1	38.9	43.6	15.4	4.8	65.1	1.1	5.4	8.2	11940	4	2090	Bone layer at base (0.1' thick). Abundant pyrite streaks.
	Coal	0.8		Bk	B			X	X		X	X	D	2.0	45.0	42.5	10.5	5.4	70.6	1.3	6.5	5.7	12980	4	2110	Large band of pyrite at base (0.1' thick). Abundant lenses of pyrite.
	Coal	0.8		Bk	B				X			X	D	3.8	42.3	45.3	8.6	5.6	71.2	1.1	8.1	5.4	12950	4½	2280	Abundant streaks of pyrite.
0.2	Claystone		S	Md dk gy																						Plant fossils.

SITE/STATION NO. 24-24	COUNTY: Venango		COAL SAMPLE NO(S).: 411413/795711/2A, 411413/795711/2B, 411413/795711/2C
COMPANY: Penn Grove	LAT. °N: 41°14'13"	ELEV. (base lower coal): 1446'	
MINE: Strip mine	LONG. °W: 79°57'11"	TWP.: Irwin	JOINTING: Coal cleat: N61W, 89NE; N70W, 83NE; N56W, vert. (½"-2" spacing); N28E, 87SE; N33E, 88SE; N4E, vert. (<½ spacing). Strike and dip on coal: N68E, 3NW; N53E, 4NW.
PERMIT: 74-10	GEOLOGIST: Reardon	15' QUADRANGLE: Hilliards	
SAMPLING METHOD: Channel	DATE: 7-8-75	7 1/2' QUADRANGLE: Barkeyville	
REPORTED COAL NAMES: Brookville			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
16	Sandstone			Lt gy																						Plant fossils common. Contains streaks of vitrain.
2.6	Coal	1.2	U	Bk	B				X			X	D	2.3	40.6	45.2	11.9	4.9	66.9	1.1	6.9	8.3	12460	5½	2340	Bone layer at base (0.1' thick). Abundant pyrite.
	Coal	0.5		Bk	B			X	X			X	D	3.1	41.6	42.4	12.9	5.1	66.5	1.1	6.7	7.7	12270	3	2220	Pyrite band at base (<1" thick). Abundant pyrite streaks and nodules.
	Coal	0.9		Bk	B		X	X				X	D	6.2	37.5	45.5	10.8	5.1	65.8	1.1	9.9	7.3	12040	4	2160	Abundant lenses of pyrite.
0.2	Claystone		S	Md dk gy																						Plant fossils (stems).

SITE/STATION NO.	33-11	COUNTY: Venango		COAL SAMPLE NO(S).:	411525/793921/A, 411525/793921/2B
COMPANY:	Jack Bros.	LAT. °N: 41°15'25"	ELEV. (base lower coal): 1453'		
MINE:	Strip mine	LONG. °W: 79°39'21"	TWP.: Richland		
PERMIT:	450-10	GEOLOGIST: Reardon	15' QUADRANGLE: Oil City	JOINTING:	Coal cleat: N29E, 80SE; N30E, 87SE (½"-2" spacing); N54W, 83SW; N58W, 85SW. Strike and dip on coal: N53E, 3NW; N67E, 3NE.
SAMPLING METHOD:	Channel	DATE: 7-7-75	7 1/2' QUADRANGLE: Cranberry		
REPORTED COAL NAMES:	Clarion			WEATHERING:	Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.0+	Clay shale		S	Dk gy																						Jointing: N32W, 89NE; N44W, 89NE; N11E, 79SE; N3E, 82SE. Plant fossils.
14.5	Sandstone		U	Md lt gy																						
10.5	Clay shale		S	Md dk gy																						Few plant fossils. Few siderite nodules.
1.9	Coal	0.9		Bk	B				X			X	D	2.2	35.9	47.9	14.0	4.8	66.5	1.2	6.3	7.2	12250	5½	2060	Bony at top of coal. Lenses and streaks of pyrite abundant.
	Coal	1.0	S	Bk	B				X			X	D	2.2	41.4	46.8	9.6	5.4	73.0	1.3	8.6	2.1	13210	6	2460	Pyrite streaks common.
	Claystone			Dk gy																						Plant fossils.

SITE/STATION NO. 34-25	COUNTY: Venango		COAL SAMPLE NO(S).: 411245/794104/2A, 411245/794104/2B
COMPANY: Clarion Realty	LAT. °N: 41°12'45"	ELEV. (base lower coal): 1420'	
MINE: Strip mine	LONG. °W: 79°41'04"	TWP.: Richland	
PERMIT: 416-4	GEOLOGIST: Reardon & Inners	15' QUADRANGLE: Foxburg	JOINTING: Coal cleat: N54W, vert.; N64W, 87NE (face); N30E,
SAMPLING METHOD: Channel	DATE: 6-4-75	7 1/2' QUADRANGLE: Emlenton	vert.; N34E, vert. (butt). Strike and dip on coal: N62E,
REPORTED COAL NAMES:			WEATHERING: Weathered 11SE; N70E, 2SE.

STRATIGRAPHIC DATA															COAL ANALYSIS												
					COAL										PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2.1	Coal			Bk																						Shaly at base.
6.0	Sandy siltstone																									*Stigmaria* abundant. Rootworked (especially in upper 18").
2.5	Silt shale			Md lt gy																						Plant fragments (stems) abundant. Shaly, micaceous.
11.0	Sand-silt laminite			Lt gy																						Predominantly sand. Lithologies intimately interbedded, with sand-sized grains predominant. Mostly planar beds; few trough crossbeds. Plant fragments (stems), carbonized, abundant.
	Sandstone			Lt gy																						
1.0	Covered																									
1.8	Coal	0.6		Bk	B			X	X	X	X	X	MB	2.0	35.5	37.4	25.1	4.1	54.9	0.8	2.1	13.0	9930	5½	2050	Pyrite abundant in streaks and nodules.[1]
	Siltstone	0.1		Md dk gy																						Plant fragments (stems) abundant. Pyritic--somewhat nodular and discontinuous.
	Coal	1.1		Bk	B		X	X			X	X	B	3.1	40.7	45.8	10.4	5.2	71.2	1.2	7.5	4.5	12840	7½	2030	Pyrite streaks abundant.[2]
	Claystone			Md gy																						Rootworked. *Stigmaria*. Plant stems.

[1] For trace element analysis, see sample #411245/794104/2B.

[2] For trace element analysis, see sample #411245/794104/2A.

SITE/STATION NO. 34-26	COUNTY: Venango		COAL SAMPLE NO(S).: 411457/794303A, 411457/794303B, 411457/794303C
COMPANY: Rockland Mining	LAT °N: 41°14'57"	ELEV. (base lower coal): 1443'	JOINTING: Coal cleat: N50W, 88SW; N65W, vert.; N58W, 89SW; N32E, 81NW; N36E, 89NW; N28E, 89NW (½"-2" spacing). Strike and dip on coal: N49W, 1SW; N15W, 2SW.
MINE: Strip mine	LONG. °W: 79°43'03"	TWP.: Rockland	
PERMIT: 1106-1	GEOLOGIST: Reardon	15' QUADRANGLE: Foxburg	
SAMPLING METHOD: Channel	DATE: 7-9-75	7 1/2' QUADRANGLE: Emlenton	
REPORTED COAL NAMES: Clarion			WEATHERING: Fresh

STRATIGRAPHIC DATA													COAL ANALYSIS													
					COAL								PROXIMATE (%)			ULTIMATE (%)										
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S: Sharp, G: Gradational, U: Uncon)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
6.0	Sandstone			Md yl bn																						Jointing: N39W, vert.; N48W, vert.; N64E, 87SE; N51E, vert.
22.4	Limestone		U	Dk gy																						
18.0	Silty claystone		S	Md gy																						Plant fossils.
14.5	Silt-clay laminite		G	Gy bk																						Plant fossils. Siderite bands common.
2.2	Coal	1.0	S	Bk	B			X			X	X	MD	2.6	40.4	49.7	7.3	5.3	74.3	1.3	7.5	4.3	13460	7	2070	Pyrite bands.
	Coal	0.6		Bk	B				X			X	D	1.9	40.3	45.2	12.6	5.3	70.3	1.3	7.9	2.6	12840	5	2400	Bone layer at base (0.1'-0.2' thick). Pyrite streaks common.
	Coal	0.6		Bk	B			X			X	X	MD	3.5	36.8	49.7	10.0	5.2	70.8	1.3	9.1	3.6	12820	6½	2130	Pyrite streaks abundant. Prominent pyrite band 0.5' from base.
0.1+	Claystone		S	Gy bk																						

SITE/STATION NO. 34-27	COUNTY Venango			COAL SAMPLE NO(S).: 411300/793920/2	
COMPANY: Equitable Coal Co.	LAT. °N: 41°13'00"	ELEV. (base lower coal):			
MINE: Strip mine	LONG. °W 79°39'20"	TWP.: Richland			
PERMIT: 1253-1	GEOLOGIST Skema	15' QUADRANGLE: Foxburg		JOINTING:	
SAMPLING METHOD: Channel	DATE: 6-17-76	7 1/2' QUADRANGLE: Emlenton			
REPORTED COAL NAMES: Lower Kittanning				WEATHERING: Fresh	

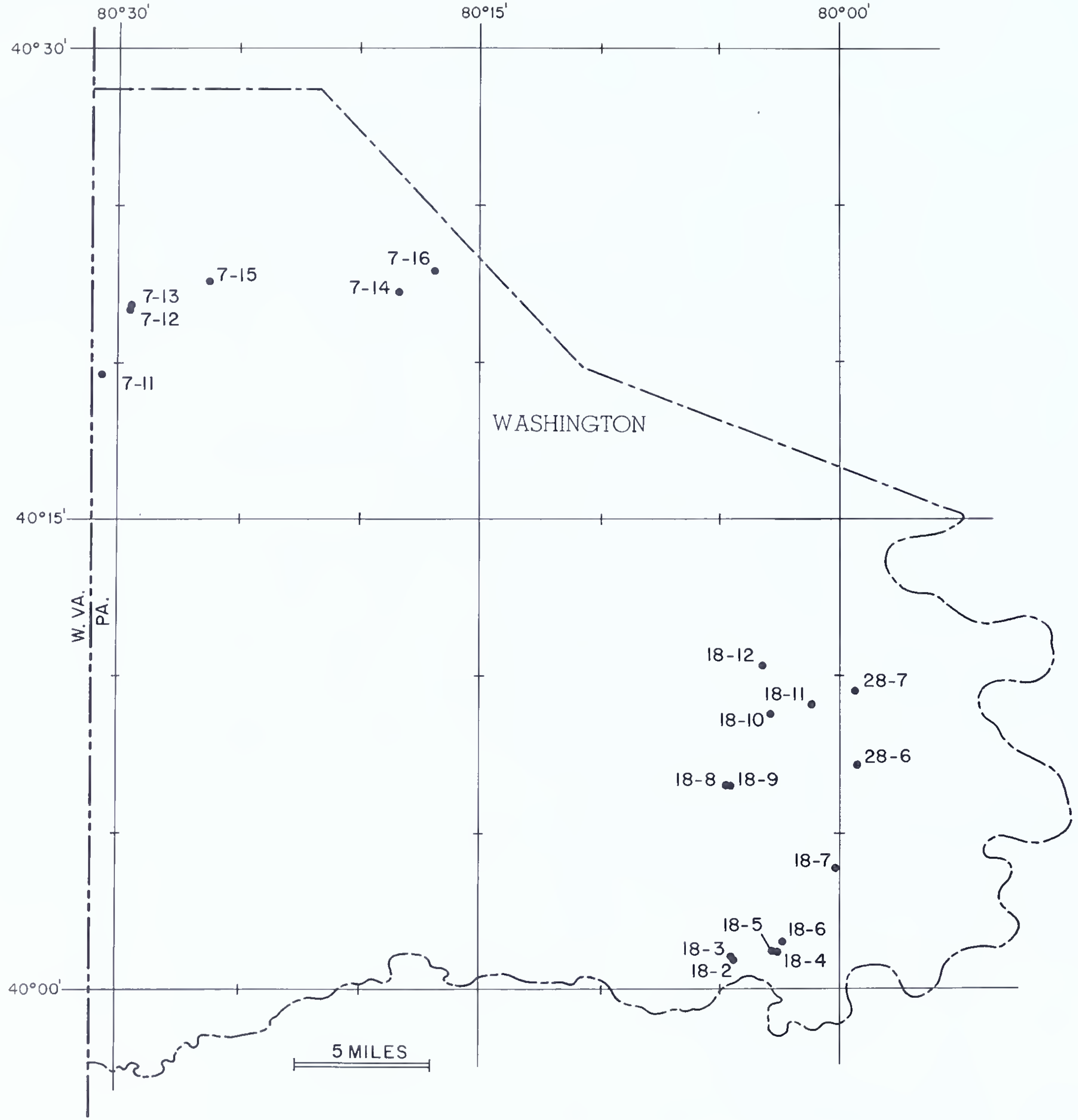
STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
7.0±	Sand-silt laminite?																									Inaccessible.
15.0±	Clay shale			Md gy																						Siderite nodules abundant. Few thin siderite beds.
4.0	Clay shale			Md gy to dk gy																						Plant material common. Siderite nodules. Few carbonaceous clay shale beds (1"-2" thick).
1.3	Clay shale			Dk gy																						*Lingula* common. Few thin sand laminae at base.
4.0	Sand-silt laminite		S	Lt gy Md dk gy																						Plant fragments common. 5" sand bed in center.
6.2	Clayey silt shale		S	Md gy																						Subfissile, weathers out in ellipsoidal pieces.
9.2	Sand-silt laminite		S	Lt gy Md dk gy																						
2.1	Coal		S	Bk	B		X				X		B	2.8	39.7	51.9	5.6	5.6	76.0	1.6	9.3	1.9	13770	8½	1980	Hard. Wet and weathered.
0.1±	Claystone		S	Lt gy																						

SITE/STATION NO. 34-28	COUNTY: Venango		COAL SAMPLE NO(S).: 411304/793934/2
COMPANY: Equitable Coal Co.	LAT. °N: 41°13'04"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 79°39'34"	TWP.: Richland	
PERMIT: 1253-1	GEOLOGIST: Skema	15' QUADRANGLE: Foxburg	JOINTING: Limestone: N88W, vert.; N6E, vert.
SAMPLING METHOD: Channel	DATE: 6-17-76	7 1/2' QUADRANGLE: Emlenton	
REPORTED COAL NAMES: Scrubgrass - Vanport			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
9.0-12.0	Limestone			Md dk gy to md lt gy																						Sparry calcite matrix. Intraclast content ~40-50% (darker and harder than matrix); intraclasts average from 1 mm up to 17 mm. Top becomes shaly (<1/32" thick laminae) and darker in color with microcrystalline matrix. Crinoid stems abundant. Coral and pelecypods common. Spherical pyrite concretions present (~1 mm).
3.5	Clay shale			Md gy																						
1.2	Coal		S	Bk	B		X	X			X		M	1.9	44.2	51.3	2.6	6.0	78.9	1.5	9.2	1.8	14370	9	2125	Very wet.
0.1	Claystone			Lt gy																						

SITE/STATION NO. 34-29	COUNTY: Venango		COAL SAMPLE NO(S).: 411306/793910/1
COMPANY: Equitable Coal Co.	LAT. °N: 41°13'06"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 79°39'10"	TWP.: Richland	
PERMIT: 1253-1	GEOLOGIST: Skema	15' QUADRANGLE: Foxburg	JOINTING:
SAMPLING METHOD: Channel	DATE: 6-17-76	7 1/2' QUADRANGLE: Emlenton	
REPORTED COAL NAMES: Middle Kittanning			WEATHERING: Fresh to weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5.0	Sandstone	5.0		Lt gy																						Coal lenses at base (up to 0.2' thick in places). Very coarse. Large-scale crossbedding.
1.4	Claystone	1.4	U	Lt gy																						Few medium-gray clay laminae.
9.2	Clay shale	3.5	S	Lt ol gy																						Bottom 0.5' hard clay.
	Clay shale	4.3	S	Md dk gy																						Thin laminae of very dark gray clay common.
	Carbonaceous clay shale	1.4	S	Dk gy																						Contorted bedding.
4.8	Claystone	4.8	S	Md gy																						Hard with conchoidal fracture.
3.0	Cover	3.0	S																							
1.2	Coal	0.3	S	Bk	B		X				X	X		4.0	36.6	52.3	7.1	5.5	74.1	1.4	9.9	2.0	13350	5	2145	Sample is composite of all 3 benches.
	Coal	0.7	S	Bk	B			X			X		M													
	Bone	0.2	S	Bk	M				X		X		D													


80°30'
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7-16
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WASHINGTON
W. VA.
PA.
18-12
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28-6
18-8
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18-7
18-5
18-6
18-3
18-4
18-2
5 MILES

SITE/STATION NO.: 7-11 (page 1)	COUNTY: Washington		COAL SAMPLE NO(S).: 401940/803050/2, 401940/803050/4, 401940/803050/6, 401940/803050/9
COMPANY: Bologna Mining Co.	LAT °N: 40°19'40"	ELEV. (base lower coal): 1048'	
MINE: Strip mine	LONG. °W: 80°30'50"	TWP.: Jefferson	
PERMIT: 248-19	GEOLOGIST: Gabler	15' QUADRANGLE: Steubenville	JOINTING: Coal cleat: N75W, 85N; N20E, vert. Strike and dip on coal: N5E, 2W.
SAMPLING METHOD: Channel	DATE: 6-25-75	7 1/2' QUADRANGLE: Steubenville East	
REPORTED COAL NAMES: Pittsburgh			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
~4.0	Shale			Lt bn																						
~1.5	Coal			Bk																						
~8.0	Limestone			Lt bn gy																						Siderite nodules (~3" diameter) rare.
~14.0	Calcareous siltstone			Lt gy																						
~12.0	Clay-shale laminite			Gy bk																						
5.75	Coal	0.5	S	Bk	B	X					X	X	M	3.3	29.8	39.0	27.9	4.1	54.3	1.2	9.3	3.2	9650	3	2250	For trace element analysis, see sample #401940/803050/9.
	Claystone	0.6	S	Dk gy to md dk gy																						1-mm bed of durain at base.
	Claystone	0.2	G	Md lt gy to md gy																						Plant stems and leaves frequent.
	Coal	2.3	S	Bk	B	X					X	X	M	2.8	37.4	55.6	4.2	5.4	77.1	1.6	10.2	1.5	13710	6	2140	Pyrite lenses (1 mm x 2 mm) rare. For trace element analysis, see sample #401940/803050/6.
	Clay shale	0.05	S	Bn bk																						Plant stems and leaves common.
	Coal	0.25	S	Bk	B	X					X	X	MB	3.3	34.0	54.5	8.2	5.1	73.2	1.6	10.9	1.0	12910	7	2910+	Pyrite lenses (4 mm x 10 mm) rare. For trace element analysis, see sample #401940/803050/4.

SITE/STATION NO. 7-11 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Clay shale	0.05	S	Bn bk																						Plant stems and leaves common.
	Coal	1.8	S	Bk	B	X				X	X	X	MB	3.1	38.1	52.5	6.3	5.1	75.0	1.6	11.0	1.0	13280	6½	2460	Pyrite lenses (1 mm x 4 mm) rare. For trace element analysis, see sample #401940/803050/2.
0.1+	Clay shale		S	Dk gy to gy bk																						

SITE/STATION NO. 7-12		COUNTY: Washington		COAL SAMPLE NO(S).: 402134/802938/3, 402134/802938/5, 402134/802938/7	
COMPANY: Pennweir Const. Co.		LAT. °N: 40°21'34"	ELEV. (base lower coal): 1080'		
MINE: Strip mine		LONG. °W: 80°29'38"	TWP.: Jefferson		
PERMIT: 13-19		GEOLOGIST: Gabler & Sholes	15' QUADRANGLE: Burgettstown	JOINTING: Coal cleat: N70W, 85N; N25E, vert. (0.2-0.8 spacing). Strike and dip on lower clay shale: N40W, 1°E.	
SAMPLING METHOD: Channel		DATE: 6-5-75	7 1/2' QUADRANGLE: Avella		
REPORTED COAL NAMES: Pittsburgh				WEATHERING: Fresh	

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
20.0+	Sandstone			Lt gy																						Shale pebbles and siderite nodules in basal 2' locally.
7.0	Clay shale		U	Bk																						Few vitrain lenses in basal 0.1'.
5.85	Coal	0.5	G	Bk	B		X				X	X	MD	2.7	38.9	32.0	26.4	4.4	55.1	1.1	6.7	6.3	10130	4	2080	1
	Clay shale	1.4	S	Dk gy																						
	Coal	2.8	S	Bk	B		X				X	X	MD	2.8	43.7	46.7	6.8	5.6	74.1	1.5	8.9	3.1	13400	5	2090	2
	Clay shale	0.05	S	Dk gy																						
	Coal	1.1	S	Bk	B	X				X	X	X	MD	3.5	38.0	47.0	11.5	4.9	68.3	1.3	8.9	5.1	12420	6	2040	Few pyrite lenses (1 x 7 mm).3
0.25	Clay shale		S	Dk gy																						
0.1+	Clay shale		G	Md gy																						

[1] For trace element analysis, see sample #402134/802938/7.

[2] For trace element analysis, see sample #402134/802938/5.

[3] For trace element analysis, see sample #402134/802938/3.

SITE/STATION NO. 7-13	COUNTY: Washington		COAL SAMPLE NO(S).: 402137/802938/4, 402137/802938/6, 402137/802938/8
COMPANY: Pennweir Const. Co.	LAT °N: 40°21'37"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 80°29'38"	TWP.: Jefferson	
PERMIT: 13-19	GEOLOGIST: Gabler & Sholes	15' QUADRANGLE: Burgettstown	JOINTING: Coal cleat: N70W, vert.; N20E, vert. (0.2'-1.0' spacing). Strike and dip on underclay: horizontal.
SAMPLING METHOD: Channel	DATE: 6-5-75	7 1/2' QUADRANGLE: Avella	
REPORTED COAL NAMES: Pittsburgh			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
20.0+	Sandstone		G	Lt gy																						
6.9	Clay shale		G	Dk gy																						
0.1	Claystone		G	Md gy																						
0.4	Clay shale		G	Bk																						
6.55	Coal	0.5	S	Bk	B	X					X	X	M	3.4	35.9	33.9	26.8	4.3	54.7	1.1	9.1	4.0	9990	5½	2180	[1]
	Claystone	1.1	S	Md gy																						
	Coal	2.9	S	Bk	B		X			X	X		MD	3.4	37.6	51.6	7.4	5.3	73.4	1.4	9.7	2.8	13140	4½	2040	Pyrite lenses common (1 mm x 7 mm).[2]
	Clay shale	0.05	S	Bn bk																						
	Coal	1.8	S	Bk	B		X				X	X	M	3.7	38.3	48.9	9.1	5.2	71.6	1.4	9.7	3.0	12780	7	2080	[3]
	Claystone	0.1	S	Dk gy																						
	Coal	0.1	S	Bk																						
0.5+	Claystone	Md gy																								

[1] For trace element analysis, see sample #402137/802938/8.

[2] For trace element analysis, see sample #402137/802938/6.

[3] For trace element analysis, see sample #402137/802938/4.

SITE/STATION NO. 7-14
COUNTY: Washington
COAL SAMPLE NO(S).: 402212/801822/5, 402212/801822/
COMPANY: Bologna Mining Co.
LAT °N: 40°22'12"
ELEV. (base lower coal): 1085'
MINE: Strip mine
LONG. °W: 80°18'22"
TWP.: Smith
PERMIT: 248-20
GEOLOGIST: Gabler & Sholes
15' QUADRANGLE: Burgettstown
JOINTING: Coal cleat: N75E, vert.; N25E, vert. (0.[illegible]-0.4 spacing).
SAMPLING METHOD: Channel
DATE: 6-3-75
7 1/2' QUADRANGLE: Midway
REPORTED COAL NAMES: Pittsburgh
WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)									
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
8.0+	Shale			Lt gy																						
1.6	Claystone			Bk																						
7.6+	Coal	3.1		Bk	B		X					X	M	3.8	37.8	44.1	14.3	5.1	67.4	1.4	11.1	0.7	12080	5½	2910+	1
	Coaly clay shale	0.3	S	Bk																						Plant fossils abundant.
	Coal	0.6	S	Bk	B		X			X	X		MD	4.9	34.3	40.4	20.4	4.8	59.7	1.2	11.2	2.7	10770	5	2350	2
	Clay shale	1.5	S	Md gy																						
	Coal	0.3	S	Bk	B	X					X		MB													
	Clay shale	1.3	S	Md gy																						
	Coal	0.5+	S	Bk	B	X					X	X	MD													

[1] For trace element analysis, see sample =402212/S01822 7.

[2] For trace element analysis, see sample =402212/801822 5.

SITE/STATION NO. 7-15	COUNTY: Washington	COAL SAMPLE NO(S).: 402233/802609/2, 402233/802609/4, 402233/802609/6, 402233/802609/8
COMPANY: Pennweir Const. Co.	LAT. °N: 40°22'34" ELEV. (base lower coal): 1059'	
MINE: Strip mine	LONG. °W: 80°26'10" TWP.: Jefferson	
PERMIT: 1134-1	GEOLOGIST: Gabler 15' QUADRANGLE: Burgettstown	JOINTING: Coal cleat: N80W, 86NE; N20E, 84NW. Jointing in sandy clay shale: N85E, vert.; N20W, vert. Strike and dip on underclay: N60E, 1NW.
SAMPLING METHOD: Channel	DATE: 6-30-75 7 1/2' QUADRANGLE: Burgettstown	
REPORTED COAL NAMES: Pittsburgh		WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
20	Overburden		G	Md bn																						
5	Sandstone		G	Bn gy																						
1.2	Calcareous clay shale		G	Dk gy bn																						
9	Sandy clay shale		G	Lt gy bn																						
1.3	Claystone		S																							
5.1	Coal	0.3	S	Bk	B				X		X	X	MB	2.1	36.8	42.7	18.4	4.8	62.4	1.3	6.0	7.1	11370	4½	2020	
	Carbonaceous clay shale	0.15	S																							
	Coal	0.7	S	Bk	B				X			X	MB	2.5	40.2	50.3	7.0	5.4	73.5	1.5	8.9	3.7	13250	4	2140	Pyrite lenses (1 mm x 3 mm).
	Clay shale	0.05	S																							
	Coal	1.8	S	Bk	B				X		X	X	MB	2.8	40.1	51.3	5.8	5.4	74.6	1.5	10.1	2.6	13380	7	2080	Pyrite lenses (1-5 mm).
	Carbonaceous clay shale	0.1	S																							
	Coal	2.0	S	Bk	B		X			X	X	X	MB	2.8	40.1	51.3	5.8	5.4	74.6	1.5	10.1	2.6	13380	7	2080	Pyrite lenses (2-10 mm).
0.1	Claystone																									Fossil stems, leaves common.

SITE/STATION NO. 7-16 (page 1)
COMPANY: Midway Coal Corp.
MINE: Strip mine
PERMIT: 1049-E
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Pittsburgh

COUNTY: Washington
LAT °N: 40°22'57"
LONG. °W: 80°16'56"
GEOLOGIST: Gabler & Sholes
DATE: 5-3-75

ELEV. (base lower coal): 1126'
TWP.: Robinson
15' QUADRANGLE: Burgettstown
7 1/2' QUADRANGLE: Clinton

COAL SAMPLE NO(S).: 402257/801656/2, 402257/801656/4, 402257/801656/6, 402257/801656/8, 402257/801656/16
JOINTING: Coal cleat: N70W, 88S; N10E, 85W.
WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.2	Clay shale			Dk gy																						
2.3	Coal			Bk	B		X	X				X	MD	2.7	34.0	39.2	24.1	4.5	57.5	1.1	7.8	5.0	10420	6	2130	Pyrite lenses (1 mm x 20 mm). For trace element analysis, see sample #402257/801656/16.
6.7	Clay shale	0.3	S	Bk																						Vitrain laminae (up to 5 mm thick) abundant.
	Coal	0.3	G	Bk	B		X				X	X	MB													
	Clay shale	0.7	S	Md gy																						Mottled with light-gray vitrain lenses.
	Coal	0.1	S	Bk	B		X					X	MB													
	Claystone	1.4	S	Md gy																						
	Coal	0.3	S	Bk	B			X			X	X	MB													
	Claystone	0.35	S	Bk																						
	Coal	0.9	S	Bk	B	X				X			M	1.9	30.9	38.9	28.3	4.0	53.7	1.1	6.6	6.3	9790	4½	2120	For trace element analysis, see sample #402257/801656/8.
	Carbonaceous clay shale	0.5	S	Bk																						
	Coal	1.05	S	Bk	B	X						X	MD	2.8	38.5	47.1	11.6	5.2	69.7	1.3	9.1	3.1	12470	7	2140	Thin interbedded shale. For trace element analysis, see sample #402257/801656/6.
	Clay shale	0.8	S	Gy bk																						

SITE/STATION NO. 7-16 (page 2)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: ELEV. (base lower coal):	
MINE:	LONG. °W: TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA					COAL										COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)									
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
			G																							
	Coal	3.6		Bk	B	X	X			X	X		MD	2.9	37.9	51.4	7.8	5.3	72.9	1.4	10.4	2.2	13120	6	2270	For trace element analysis, see sample #402257/801656/4.
			G																							
5.3	Claystone	0.25		Md gy																						
			S																							
	Coal	1.45		Bk	B		X					X	MB	2.5	39.0	50.7	7.8	5.2	71.7	1.3	10.4	3.6	12940	7	2090	For trace element analysis, see sample #402257/801656/2.
			S																							
0.6	Claystone			Md gy																						

SITE/STATION NO.	18-2	COUNTY:	Washington		COAL SAMPLE NO(S).: 400056/800427/2, 400056/800427 -
COMPANY:	Utilico Coal Co.	LAT °N: 40°00'56"	ELEV. (base lower coal): 882.5'		
MINE:	Strip mine	LONG. °W: 80°04'27"	TWP.: West Bethlehem		
PERMIT:	1240-1	GEOLOGIST: Gabler	15' QUADRANGLE: Amity		JOINTING: Coal cleat: N70W, vert.; N20E, vert. Strike and dip of underclay: N25E, 2NW.
SAMPLING METHOD:	Channel	DATE: 7-7-75	7 1/2' QUADRANGLE: Ellsworth		
REPORTED COAL NAMES:	Waynesburg				WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2+	Overburden			Lt bn																						
8	Sandstone			Bn gy																						
3.4	Sandy clay shale			Lt bn																						
3.5	Coal	1.9		Bk	B				X			X	MB	3.5	34.8	51.2	10.5	5.0	70.1	1.5	11.6	1.3	12360	2	2410	
	Claystone	0.1		Gy bk to dk gy																						
	Coal	1.5		Bk	B			X		X	X	X	M	1.9	32.9	47.8	17.4	4.8	66.7	1.5	8.1	1.5	11960	7	2910+	
0.1	Claystone			Dk gy to md dk gy																						Few plant fossils.

SITE/STATION NO. 18-3	COUNTY Washington		COAL SAMPLE NO(S).: 400057/800429/2, 400057/800429/4
COMPANY: Utilico Coal	LAT. °N: 40°00'57"	ELEV. (base lower coal): 992'	
MINE: Strip mine	LONG. °W: 80°04'29"	TWP.: West Bethlehem	
PERMIT: 1240-1	GEOLOGIST: Gabler	15' QUADRANGLE: Amity	JOINTING: Coal cleat: N70W, 88NE; N20E, vert. Strike and dip of coal: N70E, 5SE.
SAMPLING METHOD: Channel	DATE: 7-7-75	7 1/2' QUADRANGLE: Ellsworth	
REPORTED COAL NAMES: Waynesburg			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (U), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mad-bright, mid-lustrous, mad-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
8+	Backfill			Md bn																						
2.7	Clay shale			Dk gy to md dk gy																						
2.55	Coal	1.4		Bk	B				X		X	X	M	1.6	31.5	42.5	24.4	4.4	60.3	1.4	7.0	2.5	10880	5	2590	Few pyrite lenses (1 mm x 6 mm).
	Coaly clay shale	0.05		Bk to gy bk																						
	Coal	1.1		Bk	B				X		X	X	MB	2.3	32.6	46.1	19.0	4.7	64.3	1.4	8.2	2.4	11590	7	2630	Few pyrite lenses (1 mm x 4 mm). Blocky and hard.
0.1+	Claystone			Gy bk to dk gy																						

SITE/STATION NO. 18-4 (page 1)	COUNTY: Washington		COAL SAMPLE NO(S).: 400110/800240/9, 400110/8002-0 12
COMPANY: Utilico Coal	LAT. °N: 40°01'10"	ELEV. (base lower coal): 1087' (upper coal)	
MINE: Strip mine	LONG. °W: 80°02'40"	TWP.: Deemston	
PERMIT: 1240-1	GEOLOGIST: Gabler	15' QUADRANGLE: Amity	JOINTING: Coal cleat: N60W, vert.; N20E, vert. Strike and
SAMPLING METHOD: Channel	DATE: 7-1-75	7 1/2' QUADRANGLE: Ellsworth	dip of coal: N60E, 2NW.
REPORTED COAL NAMES:			WEATHERING: Fresh to weathered

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
8.0+	Overburden			Lt bn																						
9.0	Clay shale		S	Md bn																						
2.0	Limestone		S	Lt bn																						
0.7	Calcareous clay shale		S	Md gy to md dk gy																						
3.2	Coal	0.8	S	Bk	B				X			X	M	1.7	26.9	35.0	36.4	3.3	45.2	0.8	2.3	12.0	8540	4	1990	
	Clay shale	0.5	G	Md gy to md dk gy																						
	Claystone	0.2	S	Md gy to md dk gy																						Calcite encrusted.
	Coal	1.7	S	Bk	B				X			X	M	2.3	35.5	43.5	18.7	4.7	64.8	1.3	6.9	3.6	11720	7	2090	
1.9	Clay shale		G	Dk gy to gy bk																						
0.7	Coaly clay shale		S	Bk																						Plant fossils abundant.
1.0	Limestone		S	Lt bn gy																						
4.0	Calcareous sandy claystone		G	Md gy																						
~24.0	Calcareous silty claystone		G	Lt gy																						
~2.0	Siltstone			Lt gy																						

SITE/STATION NO. 18-4 (page 2)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT °N: ELEV. (base lower coal):	
MINE:	LONG. °W: TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA					COAL	VITRAIN								COAL ANALYSIS												
						ABUNDANCE				THICKNESS				PROXIMATE (%)			ULTIMATE (%)									
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
~24.0	Silt-clay laminite		S	Md gy Md dk gy																						
5.0	Coal			Bk																						See sample #400110/800243/2, 4, 6 (site no. 18-5) for analysis and description.

SITE/STATION NO. 18-5	COUNTY: Washington		COAL SAMPLE NO(S).: 400110/800243/2, 400110/800243/4,
COMPANY: Utilico Coal	LAT °N: 40°01'10"	ELEV. (base lower coal): 1033'	400110/800243/6
MINE: Strip mine	LONG. °W: 80°02'43"	TWP.: Deemston	
PERMIT: 1240-1	GEOLOGIST: Gabler	15' QUADRANGLE: Amity	JOINTING: Coal cleat: N70W, 86SW; N20E, vert. Silt-clay
SAMPLING METHOD: Channel	DATE: 7-1-75	7 1/2' QUADRANGLE: Ellsworth	laminite joint: N30W, 86S. Strike and dip of coal: N65E,
REPORTED COAL NAMES: Waynesburg			WEATHERING: Fresh 2°N.

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)									
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10.0+	Overburden			Bn gy																						
~9.0	Sandy clay shale			Md bn gy																						
~12.0	Silt-clay laminite			Bn gy																						Micaceous.
3.0	Clay shale			Lt gy																						
9.5	Coal	1.1		Bk	B				X			X	MD	7.3	27.5	40.8	24.4	4.6	55.0	1.2	12.0	2.8	9710	1½	2200	
	Clay shale	3.1	S	Md gy to md dk gy																						
	Coal	1.6	S	Bk	B			X			X	X	M	1.9	36.6	46.3	15.2	5.0	70.0	1.7	6.5	1.6	12470	3½	2780	
	Claystone	0.9	S	Md gy to md dk gy																						
	Coal	2.8	S	Bk	B			X		X	X	X	MB	1.9	32.5	47.6	18.0	4.7	66.3	1.5	6.4	3.1	11860	7½	2200	
0.1+	Coaly clay shale		S	Md dk gy to dk gy																						Plant fossils common.

SITE/STATION NO. 18-6 (page 1)
COMPANY: Gysegem Enterprises
MINE: Strip mine
PERMIT: 90-13
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Waynesburg A

COUNTY: Washington
LAT. °N: 40°01'38"
LONG. °W: 80°02'20"
GEOLOGIST: Gabler
DATE: 7-7-75

ELEV. (base lower coal): 1074'
TWP.: Deemston
15' QUADRANGLE: Amity
7 1/2' QUADRANGLE: Ellsworth

COAL SAMPLE NO(S).: 400138/800220/4, 400138/800220/6, 400138/800220/8
JOINTING: Coal cleat: N70W, vert.; N20E, vert. Strike and dip of coal: N20E, 4NW.
WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2.0	Overburden			Lt bn																						
5.0	Clay shale			Lt bn																						
0.4	Calcareous clay shale			Bn bk																						
2.0	Limestone		S	Md gy to md dk gy																						
3.0	Calcareous clay shale		S	Md gy to md dk gy																						
1.0	Limestone		S	Md gy to md dk gy																						
4.0	Calcareous clay shale		S	Md dk gy to dk gy																						
7.7	Coal	0.9	S	Bk	B				X			X	M	2.1	32.2	40.4	25.3	4.3	58.5	1.2	6.3	4.4	10600	5	2240	
	Calcareous clay shale	0.1	G	Dk gy to gy bk																						Plant stems rare.
	Coal	1.7	S	Bk	B				X			XX	MD	1.7	34.0	43.8	20.5	4.5	62.7	1.3	7.1	3.9	11370	6½	2140	
	Carbonaceous clay shale	4.0	S	Dk gy to gy bk																						
	Coal	1.0	G	Bk	B				X			X	MD	1.7	27.9	34.5	35.9	3.5	49.8	0.9	6.2	3.7	8910	2	2190	

SITE/STATION NO. 18-6 (page 2)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUN-DANCE				THICK-NESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1.0	Claystone		S	Md dk gy to dk gy																						
0.8	Limestone		S	Md bn																						
0.8	Claystone		S	Md dk gy to dk gy																						

SITE/STATION NO. 18-7
COMPANY: Etna Equipment & Supply
MINE: Strip mine
PERMIT: 634-4
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Waynesburg
COUNTY: Washington
LAT. °N: 40°03'54"
LONG. °W: 80°00'05"
GEOLOGIST: Gabler
DATE: 6-12-75
ELEV. (base lower coal): 1136'
TWP.: West Pike Run
15' QUADRANGLE: Amity
7 1/2' QUADRANGLE: Ellsworth
COAL SAMPLE NO(S).: 400354/800005/2, 400354/800005/4, 400354/800005/6, 400354/800005/8
JOINTING: Coal cleat: N70W, vert.; N20E, vert. Strike and dip of coal: N70W, 5NE.
WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
20.0+	Sandstone		G	Bn																						
5.0+	Sandstone		S	Lt bn																						
7.85	Coal	0.8	S	Bk	B		X				X	X	MO	4.8	33.4	41.1	20.7	4.7	60.6	1.2	10.5	2.3	10770	5½	2190	[1]
	Claystone	1.6	S	Md gy																						
	Coal	3.1	S	Bk	B		X				X	X	MD	4.9	34.8	46.9	13.4	5.2	67.1	1.4	11.1	1.8	12000	5	2680	[2]
	Claystone	0.8	S	Md lt gy																						
	Coal	0.3	S	Bk	B		X				X	X	M	2.7	37.4	44.2	15.7	5.0	67.1	1.4	8.4	2.4	12200	7	2630	[3]
	Claystone	0.25	S	Md gy																						
	Coal	1.0	S	Bk	B		X				X	X	M	4.2	31.3	39.8	24.7	4.5	58.8	1.3	8.9	1.8	10480	7	2730	[4]
0.5+	Claystone			Md gy																						Plant fragments rare.

[1] For trace element analysis, see sample #400354/800005/8.

[2] For trace element analysis, see sample #400354/800005/6.

[3] For trace element analysis, see sample #400354/800005/4.

[4] For trace element analysis, see sample #400354/800005/2.

SITE/STATION NO. 18-8	COUNTY. Washington		COAL SAMPLE NO(S).: 400628/800450/4, 400628/800450/6
COMPANY: KES Enterprises	LAT. °N: 40°06'28"	ELEV. (base lower coal): 982'	
MINE: Strip mine	LONG. °W: 80°04'50"	TWP.: Somerset	
PERMIT: 1139-1	GEOLOGIST: Gabler	15' QUADRANGLE: Amity	JOINTING: Strike and dip of coal: horizontal.
SAMPLING METHOD: Channel	DATE: 6-12-75	7 1/2' QUADRANGLE: Ellsworth	
REPORTED COAL NAMES: Waynesburg			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5+	Overburden			Bn																						
6.25	Claystone		G	Md gy																						
6.0	Coal	1.3	S	Bk	B		X				X	X	M	3.0	36.5	41.8	18.7	4.8	64.1	1.4	8.0	3.0	11540	7	2140	For trace element analysis, see sample #400628/800450/6.
	Claystone	1.1	S	Md dk gy																						Pyrite lenses (1½" x 16").
	Coal	3.6	S	Bk	B		X					X	MD	1.2	35.8	46.7	16.3	4.8	67.2	1.5	6.8	3.4	12140	7	2160	For trace element analysis, see sample #400628/800450/6.
0.15	Claystone		S	Md gy																						
0.15	Clay shale		S	Gy bk																						
0.1	Claystone		S	Md gy																						

SITE/STATION NO. 18-9
COUNTY: Washington
COAL SAMPLE NO(S).: 400634/800439/2
COMPANY: KES Enterprises
LAT. °N: 40°06'34"
ELEV. (base lower coal): 1001'
MINE: Strip mine
LONG. °W: 80°04'39"
TWP.: Somerset
PERMIT: 1139-2
GEOLOGIST: Gabler & Sholes
15' QUADRANGLE: Amity
JOINTING: Coal cleat: N65W, 87NE; N25E, 85NW. Strike and dip of coal: N38E, 5SE.
SAMPLING METHOD: Channel
DATE: 6-4-75
7 1/2' QUADRANGLE: Ellsworth
REPORTED COAL NAMES: Waynesburg
WEATHERING: Fresh

STRATIGRAPHIC DATA													COAL ANALYSIS													
					COAL								PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Cloroin-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
4+	Overburden		G	Lt gy to bn																						
6+	Clay shale		S	Md gy																						
5.05	Coal	1.0	S	Bk	B			X		X	X	X	M													Pyrite lenses abundant.
	Clay shale	0.8	S	Lt gy																						Plant fossils common.
	Coal	3.25	S	Bk	B						X		MD	1.5	36.4	46.6	15.5	4.9	68.4	1.6	7.9	1.7	12310	7	2680	Pyrite lenses common (4 mm x 50 mm). For trace element analysis, see sample #400634/800439/2.
0.5	Claystone			Lt gy																						

SITE/STATION NO. 18-10
COMPANY: Twilight Coal Co.
MINE: Strip mine
PERMIT: 1-60
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Waynesburg

COUNTY: Washington
LAT. °N: 40°08'46"
LONG. °W: 80°02'56"
GEOLOGIST: Gabler
DATE: 6-9-75

ELEV. (base lower coal): 1040'
TWP.: Somerset
15' QUADRANGLE: Amity
7 1/2' QUADRANGLE: Hackett

COAL SAMPLE NO(S).: 400846/800256/4, 400846/800256/7
JOINTING: Coal cleat: N70W, vert.; N20E, vert. Strike and dip of coal: N10E, 5NW.
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
~8.0	Overburden--sandy			Lt bn																						
15.0	Sandstone			Gy bn																						
12.0	Silty shale		G	Md gy																						Plant fossils common.
6.6	Coal	1.0	S	Bk	B	X				X	X		M	4.7	36.1	40.2	19.0	4.9	62.7	1.3	8.8	3.3	11300	7	2250	Pyrite lenses (3/4" x 14").[1]
	Claystone	1.0	S	Md dk gy																						
	Bone coal	0.2	S	Bk																						
	Coal	4.2	S	Bk	B	X				X	X	X	M	2.6	37.2	42.3	17.9	4.9	65.1	1.3	7.3	3.5	11790	5	2410	Pyrite lenses (1 mm x 10 cm).[2]
	Claystone	0.1	S	Md gy																						
	Coaly clay shale	0.1	S	Bk																						
0.5+	Claystone		S	Md gy																						

[1] For trace element analysis, see sample #400846/800256/7.

[2] For trace element analysis, see sample #400846/800256/4.

SITE/STATION NO. 18-11	COUNTY: Washington		COAL SAMPLE NO(S).: 400901/800108/2, 400901/800108/4
COMPANY: Penn Sherman	LAT. °N: 40°09'01"	ELEV. (base lower coal): 1043'	
MINE: Strip mine	LONG. °W: 80°01'08"	TWP.: Somerset	
PERMIT: 1134-1	GEOLOGIST: Gabler	15' QUADRANGLE: Amity	JOINTING: Coal cleat: N70W, 86SW (face) (0.5'-1.2' spacing);
SAMPLING METHOD: Channel	DATE: 6-4-75	7 1/2' QUADRANGLE: Hackett	N30E, 86NW (butt). Strike and dip: N55E, 6SE.
REPORTED COAL NAMES: Waynesburg			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)			ULTIMATE (%)										
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
6.0+	Soil																									
6.0+	Clay-silt laminite			Dk gy Lt gy																						
3.0±	Coal		S	Gy bk																						Interbedded with shale. Upper half less shaly.
4.0±	Calcareous claystone		S	Ol gy																						
18.0+	Silty clay shale		G	Lt gy																						Siderite nodules (up to 0.1' x 0.2'). Micaceous.
5.3	Silty clay shale		G	Md gy																						Micaceous.
5.5	Coal	1.1	S	Bk	B	X				X	X		MD	2.9	35.6	44.9	16.6	4.8	67.0	1.5	7.5	2.6	12060	7½	2190	
	Claystone	0.8	S	Md gy																						
	Coal	3.6	S	Bk	B		X			X	X	X	MD	2.3	35.8	45.9	16.0	4.8	67.8	1.4	6.4	3.6	12150	7½	2330	Pyrite lenses common. For trace element analysis, see sample #400901/800108/2.
	Claystone		S	Md gy																						

SITE/STATION NO. 18-12	COUNTY Washington		COAL SAMPLE NO(S).: 401013/800308/3, 401013/800308/6
COMPANY: Twilight Coal Co.	LAT. °N: 40°10'13"	ELEV. (base lower coal): 1152'	
MINE: Strip mine	LONG. °W: 80°03'08"	TWP.: Nottingham	
PERMIT: 1-64	GEOLOGIST: Gabler	15' QUADRANGLE: Amity	JOINTING: Strike and dip of coal: N7W, 3NE.
SAMPLING METHOD: Channel	DATE: 6-2-75	7 1/2' QUADRANGLE: Hackett	
REPORTED COAL NAMES: Waynesburg			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
9.0+	Sandstone			Lt gy																						
8.6	Clay shale			Bk																						Plant fragments common.
6.05	Coal	1.05	S	Bk	B			X				X	D	8.1	30.0	42.6	19.3	4.7	59.7	1.3	13.7	1.3	10490	2	2190	1
	Claystone	0.8	S	Lt gy																						
	Bony coal	0.5	S	Bk																						
	Coal	3.2	G	Bk	B	X					X	X	MB	2.1	38.8	44.5	14.6	5.1	68.8	1.4	7.4	2.7	12430	6½	2430	Pyrite lenses common.[2]
	Bony coal	0.5	S	Bk																						
0.5+	Claystone		S	Md gy																						

[1] For trace element analysis, see sample #401013/800308/6.

[2] For trace element analysis, see sample #401013/800308/3.

SITE/STATION NO. 28-6
COMPANY: Etna Equip.
MINE: Strip mine
PERMIT: 634-1
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Waynesburg

COUNTY: Washington
LAT. °N: 40°07'10"
LONG. °W: 79°59'08"
GEOLOGIST: Gabler
DATE: 6-4-75

ELEV. (base lower coal): 1067'
TWP.: Fallowfield
15' QUADRANGLE: Brownsville
7 1/2' QUADRANGLE: California

COAL SAMPLE NO(S).: 400710/795908/2, 400710/795908/4, 400710/795908/6, 400710/795908/7, 400710/795908/9

JOINTING: Coal cleat: N70W, vert.; N30E, 85W. Strike and dip of coal: N80W, 2NW.

WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)									
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Bonded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2.0+	Coal		S																							
6.0+	Clay shale		G																							
10.0+	Sandstone		S	Lt gy																						
2.0	Claystone		S	Md gy																						
6.86	Coal	1.2		Bk	B		X					X	MD	2.9	33.0	43.7	20.4	4.6	63.0	1.3	8.1	2.6	11360	7½	2190	1
	Claystone	0.8		Md gy																						
	Coal	1.6		Bk	B			X			X	X	MB	1.8	39.1	47.6	11.5	5.3	72.0	1.5	6.4	3.3	13020	7½	2290	2
	Coal	1.25		Bk	B		X				X	X	M	3.7	35.8	46.0	14.5	5.0	67.8	1.3	9.0	2.4	12100	8	2620	3
	Claystone	0.6		Md gy																						
	Coal	0.8		Bk	B			X			X	X	MB	2.1	32.2	39.1	26.6	4.4	58.5	1.2	7.4	1.9	10510	5½	2910+	4
	Claystone	0.01		Gy bk																						
	Coal	0.6	S	Bk	B			X				X	MB	4.0	32.3	44.9	18.8	4.7	63.5	1.4	8.9	2.7	11400	7	2390	Stained along joints.[5]
0.1+	Silty claystone			Lt gy																						

[1] For trace element analysis, see sample #400710/795908/9.

[2] For trace element analysis, see sample #400710/795908/7.

[3] For trace element analysis, see sample #400710/795908/6.

[4] For trace element analysis, see sample #400710/795908/4.

[5] For trace element analysis, see sample #400710/795908/2.

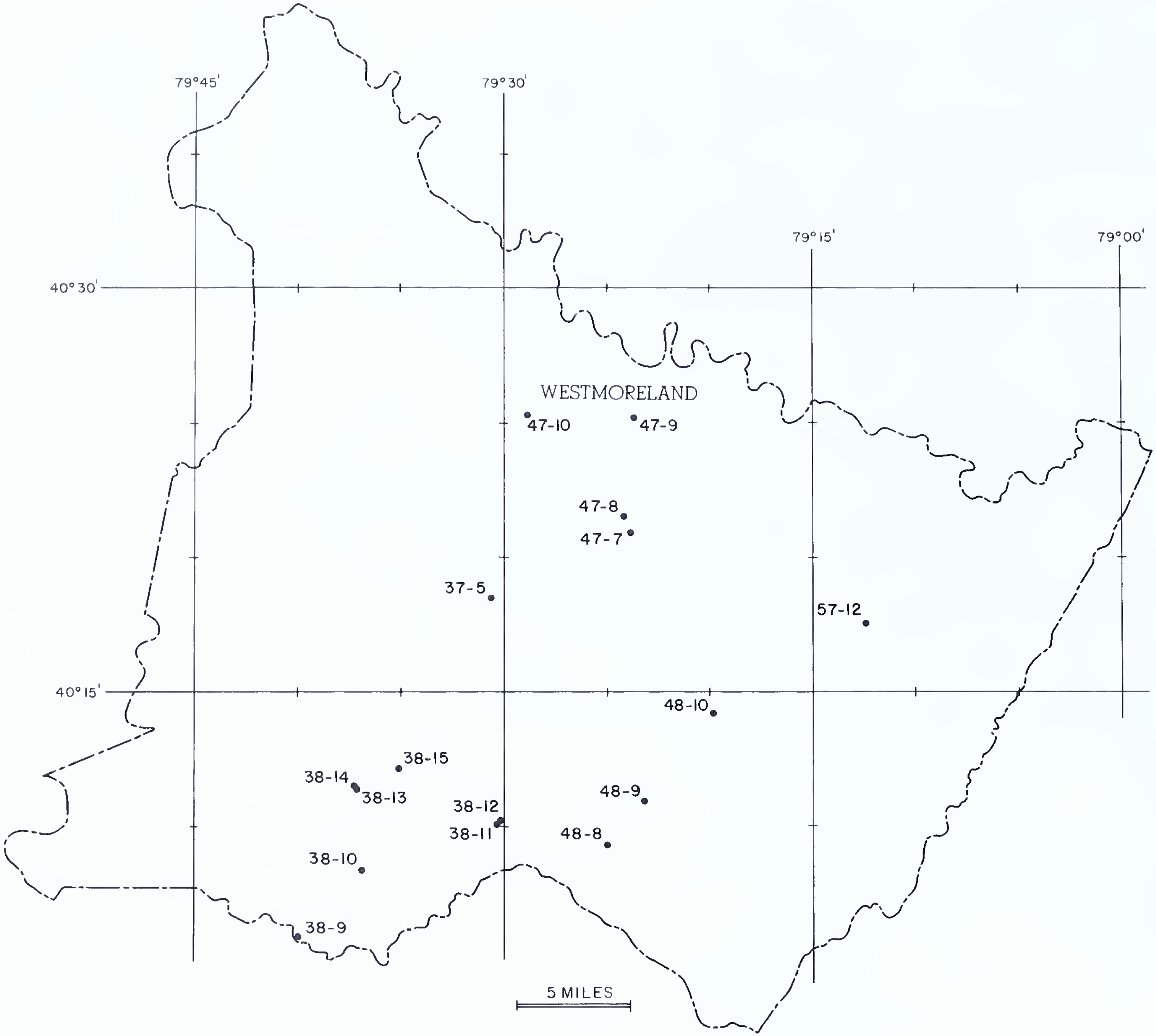
SITE/STATION NO. 28-7
COMPANY: National Industries
MINE: Strip mine
PERMIT: 528-5
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Waynesburg

COUNTY: Washington
LAT. °N: 40°09'34"
LONG. °W: 79°59'23"
GEOLOGIST: Gabler
DATE: 6-11-75

ELEV. (base lower coal): 1064'
TWP.: Fallowfield
15' QUADRANGLE: Brownsville
7 1/2' QUADRANGLE: Monongahela

COAL SAMPLE NO(S).: 400934/805923/2, 400934/805923/4, 400934/805923/6
JOINTING: Coal cleat: N70W, vert.; N20E, 83W.
WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S: Sharp, G: Gradational, U: Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
~15.0	Sandstone			Lt bn																						
~6.0	Sandstone		G	Gy																						Micaceous.
5.6	Silty clay shale		S	Md gy																						
	Coal	1.0	S	Bk	B		X				X	X	M	3.5	34.2	44.1	18.2	4.8	64.8	1.4	8.3	2.5	11630	5½	2430	
	Claystone	0.9	S	Md gy to md lt gy																						
5.55	Coal	2.75	S	Bk	B	X					X	X	M	1.8	38.8	46.3	13.1	5.1	69.9	1.5	6.6	3.8	12650	7½	2140	Few pyrite lenses (up to 1 mm x 12 cm).
	Claystone	0.1	S	Md dk gy																						
	Coal	0.8	S	Bk	B		X			X	X	X	MD	2.4	34.0	40.0	23.6	4.5	60.7	1.3	7.1	2.8	10910	6	2480	
0.1+	Silty clay shale		S	Md lt gy to md gy																						


79°45'
79°30'
79°15'
79°00'
40°30'
40°15'
WESTMORELAND
47-10
47-9
47-8
47-7
37-5
57-12
48-10
38-15
38-14
38-13
48-9
38-12
38-11
48-8
38-10
38-9
5 MILES

SITE/STATION NO. 37-5	COUNTY: Westmoreland		COAL SAMPLE NO(S).: 401827/793034
COMPANY:	LAT. °N: 40°18'27"	ELEV. (base lower coal):	
MINE: Road cut, U. S. Route 119	LONG. °W: 79°30'34"	TWP.: Hempfield	
PERMIT:	GEOLOGIST: Sholes & Parrish	15' QUADRANGLE: Greensburg	JOINTING: In lower limestone: N18E, 71S; N18E, [illegible]. N51W, vert.; N80W, 84N; N65W, vert.
SAMPLING METHOD:	DATE: 6-16-76	7 1/2' QUADRANGLE: Greensburg	
REPORTED COAL NAMES:			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Clay shale			Md gy																						Rare sand laminae--very fine grained (<1 mm thick). Siderite.
0.8	Coal			Bk	B		X				X	X	D	1.2	24.8	38.5	35.5	3.9	52.6	1.3	5.0	1.8	9452	4	2280	
5.0	Clay shale		S	Md dk gy																						Silty. Limestone nodules at top (0.4' x 0.2').
1.6	Limestone		S	Md bn																						
1.6-2.1	Claystone		G	Md gy																						Pinches out to north and south. Limestone nodules (0.1' x 0.4').
2.8	Limestone		S	Md bn																						Possible algal laminae near top. Micritic texture. Irregular lower contact.
4.3	Claystone		G	Ol gy and md gy to md lt gy																						Carbonate nodules (0.1' x 0.4').
0-0.65	Silty sandstone		S	Md lt gy																						Micaceous; irregular thickness. Very fine grained.
5.0	Claystone		G	Md lt gy																						

SITE/STATION NO. 38-9	COUNTY: Westmoreland		COAL SAMPLE NO(S).: 400553/794001/2B, 400553/794001/2D, 400553/794001/2F
COMPANY:	LAT. °N: 40°05'53"	ELEV. (base lower coal): ~1020'	
MINE: Railroad cut	LONG. °W: 79°40'01"	TWP.: South Huntingdon	
PERMIT:	GEOLOGIST: Sholes	15' QUADRANGLE: Connellsville	JOINTING:
SAMPLING METHOD: Channel	DATE: 6-24-76	7 1/2' QUADRANGLE: Dawson	
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncan.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2mm	Clarain-Durain Luster (bright, mad-bright, mid-lustrous, mad-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
~15	Sandstone			Pale yl bn to mod yl bn																						Fine to medium grained. Lower contact irregular and scoured. Large-scale festoon cross-bedding and ripple bedding locally visible.
4.25-4.55	Bony coal	0-0.3		Bk																						Locally squeezed out by sandstone. Grades laterally into gray shale.
	Coal	2.3		Bk	B		X				X	X	MD	2.0	34.0	58.8	5.2	5.6	79.9	1.5	7.1	0.8	14455	8½	2255	Variable thickness. Nearly removed by overlying sandstone in places.
	Clay shale	0.2	S	Dk gy																						
	Coal	1.25	S	Bk	B		X				X	X	B	2.7	33.8	60.1	3.4	5.7	80.7	1.5	7.6	1.1	14552	9	2225	
	Clay shale	0.1	S	Dk bn gy																						
	Coal	0.4	S	Bk	B	X					X	X	MB	4.1	30.8	51.7	13.4	4.9	69.1	1.2	8.1	3.2	12482	8½	2295	
0.65	Clay shale		S	Bk																						Very hard.
0.7	Claystone			Bn gy																						Basal contact wavy.
1.0	Hard clay?			Bn gy																						
1.0+	Claystone			Bn gy																						

SITE/STATION NO. 38-10	COUNTY: Westmoreland	COAL SAMPLE NO(S).: 400824/793655/2
COMPANY:	LAT. °N: 40°08'24" / ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 79°36'55" / TWP.: East Huntingdon	
PERMIT:	GEOLOGIST: Sholes & Parrish / 15' QUADRANGLE: Connellsville	JOINTING:
SAMPLING METHOD: Channel	DATE: 6-17-76 / 7 1/2' QUADRANGLE: Mt. Pleasant	
REPORTED COAL NAMES: Pittsburgh		WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Banded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2-6	Clay shale																									Weathered.
14.22	Coal	1.3		Bk										21.4	21.3	34.8	22.5	4.8	40.1	0.9	31.1	0.6	6480	0	2800+	Too weathered to describe. Discontinuous clay shale partings.
	Claystone	0.8		Pale yl bn																						
	Claystone	0.55	G	Gy bk																						
	Coal	0.8	S	Bk	B		X					X	D	11.7	24.8	47.8	15.7	4.6	55.8	1.2	21.8	0.9	9580	0	2800+	Weathered.
	Claystone	0.9		Gy bk																						
	Coal	0.7		Bk	B		X					X	MD	7.5	21.9	44.7	25.9	4.3	53.5	1.1	14.2	1.0	9210	0	2800+	Bony at top.
	Claystone	1.0		Gy bk																						
	Coal	2.6		Bk	B	X					X		MB	8.7	26.7	51.8	12.8	5.0	63.0	1.4	16.8	1.0	10950	1	2800+	
	Bone coal	0.1		Bk																						
	Coal	2.9		Bk	B		X				X	X	B	7.0	27.9	59.8	5.3	5.2	72.4	1.6	14.7	0.8	12670	1½	2800+	
	Claystone	0.07		Md gy bn																						
	Coal	2.5		Bk	B	X					X		MB	6.1	28.3	60.9	4.7	5.0	74.3	1.5	13.7	0.8	13160	1½	2800+	Discontinuous shale lenses (up to 0.05' thick).
0.2+	Claystone	0.2+		Md gy																						Scattered vitrain layers (0.2'+ thick).

SITE/STATION NO. 38-11	COUNTY Westmoreland	COAL SAMPLE NO(S).: 401001/793017/2A, 401001/793017/2C, 401001/793017/2D, 401001/793017/2E
COMPANY:	LAT °N: 40°10'01" ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 79°30'17" TWP.: Mt. Pleasant	
PERMIT:	GEOLOGIST: Sholes & Parrish 15' QUADRANGLE: Connellsville	JOINTING:
SAMPLING METHOD: Channel	DATE: 6-16-76 7 1/2' QUADRANGLE: Mt. Pleasant	
REPORTED COAL NAMES: Redstone		WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)			ULTIMATE (%)										
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
~15	Shale			Gy bk																						Weathered. Limonite staining.
6.85	Coal	2		Bk	B		X					X	MB	1.1	31.4	56.9	10.6	5.1	73.8	1.6	6.1	2.8	13630	9	2100	Plant fragments.
	Coaly shale	1.1		Gy bk										1.4	12.9	16.3	69.4	2.2	21.7	0.5	5.4	0.8	3810	0	2800+	
	Coal	2.5		Bk	B	X					X	X	MB	1.0	31.0	60.7	7.3	5.2	77.3	1.6	6.5	2.1	14170	9	2415	
	Bone coal	0.35		Bk																						
	Coal	0.9		Bk	B		X					X	MD	1.7	28.3	55.6	14.4	4.8	70.3	1.4	5.7	3.4	12890	8½	2045	
	Claystone			Md dk gy																						Plant fragments.

SITE/STATION NO. 38-12
COMPANY:
MINE: Strip mine
PERMIT:
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Sewickley

COUNTY Westmoreland
LAT °N: 40°10'15"
LONG. °W: 79°30'08"
GEOLOGIST: Sholes & Parrish
DATE: 6-16-76

ELEV. (base lower coal):
TWP.: Mt. Pleasant
15' QUADRANGLE: Connellsville
7 1/2' QUADRANGLE: Mt. Pleasant

COAL SAMPLE NO(S).: 401015/793000 2A, [illegible]
401015/79300c, 202, 401015 [illegible]
JOINTING:
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Clay shale			Gy																						
6	Limestone			Gy																						Sandy. Interbedded clay shale.
3.7	Claystone			Md gy																						Slickensides.
5.95	Coal	0.35		Bk	B			X			X	X	MD	0.8	23.8	45.9	29.5	3.8	55.3	1.1	3.1	7.2	10222	5	2260	
	Clay shale	0.8		Bn bk																						Fissile.
	Clay shale	1.1		Bk																						Blocky. Vitrain layers.
	Coal	1.5		Bk	B	X	X	X	X		X		MB	1.0	26.8	45.6	26.6	4.4	58.8	1.2	3.9	5.1	10900	8	2280	Top 0.75' of bench (lower in vitrain .
														1.1	31.8	55.0	12.1	5.2	73.6	1.7	5.1	2.3	13410	9	2800+	Bottom 0.75' of bench (vitrain content increases downward).
	Clay shale	0.85		Bk																						
	Coal	1.35		Bk	B	X					X	X	B	0.5	31.2	55.4	11.9	5.1	73.1	1.7	5.5	2.7	13280	9	2605	
	Claystone			Bn bk																						Pyrite nodules (0.1' x 0.03'). Vitrain abundant.

SITE/STATION NO. 38-13	COUNTY: Westmoreland		COAL SAMPLE NO(S).: 401125/793711/2A, 401125/793711/2B
COMPANY:	LAT. °N: 40°11'25"	ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 79°37'11"	TWP.: East Huntingdon	
PERMIT:	GEOLOGIST: Sholes & Parrish	15' QUADRANGLE: Connellsville	JOINTING:
SAMPLING METHOD: Channel	DATE: 6-15-76	7 1/2' QUADRANGLE: Mt. Pleasant	
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
19	Sandstone																									
3.5-3.7	Shaly coal	0.2-0.4		Bk										2.0	26.4	43.0	28.6	3.8	51.5	1.0	4.4	10.6	9796	4	2245	Fissile.
	Coal	3.3		Bk	B	X						X	MB	2.1	34.4	57.1	6.4	5.4	78.1	1.4	6.3	2.3	14143	9	2095	
0.2	Claystone			Gy																						

SITE/STATION NO. 38-14	COUNTY: Westmoreland	COAL SAMPLE NO(S).: 401134/793713/3, 401134/793713/4
COMPANY:	LAT °N: 40°11'34" / ELEV. (base lower coal):	
MINE: Strip mine	LONG. °W: 79°37'13" / TWP.: East Huntingdon	
PERMIT:	GEOLOGIST: Sholes & Parrish / 15' QUADRANGLE: Connellsville	JOINTING: Coal cleat: N73W, 82N; N68W, vert. (face); N15W, 85N (butt).
SAMPLING METHOD: Channel	DATE: 6-15-76 / 7 1/2' QUADRANGLE: Mt. Pleasant	
REPORTED COAL NAMES: Upper Freeport		WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
30	Sandstone																									
2.8-4.3	Bone coal	0.1-0.3		Bk																						
	Coal	1.0-1.8		Bk	B		X					X	B	2.3	32.1	51.9	13.7	5.0	69.8	1.2	6.1	4.1	12739	8	2210	
	Carbonaceous clay shale	0.2-0.6		Dk gy to gy bk																						Plant fossils.
	Coal	1.2		Bk										3.6	31.3	55.7	9.4	5.2	72.6	1.3	9.1	2.4	13055	9	2110	
	Claystone	0.1-0.2		Md dk gy																						
	Coal	0.2		Bk	B		X					X	MD													
2.5	Claystone			Md gy																						
0.5	Claystone			Md dk gy																						Limonite nodules.

SITE/STATION NO. 38-15	COUNTY: Westmoreland		COAL SAMPLE NO(S).: 401209/793503
COMPANY:	LAT °N: 40°12'09"	ELEV. (base lower coal):	
MINE: Roadcut, U. S. Route 119	LONG. °W: 79°35'03"	TWP.: Hempfield	
PERMIT:	GEOLOGIST: Sholes & Parrish	15' QUADRANGLE: Connellsville	JOINTING: In top sandstone: E-W, vert.; N6W, 85W. Coal
SAMPLING METHOD: Channel	DATE: 6-15-76	7 1/2' QUADRANGLE: Mt. Pleasant	cleat: (face) N60E, 80S; N74W, vert.; N69W, 88S; butt
REPORTED COAL NAMES:			WEATHERING: Weathered cleat poorly exposed.

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Sandstone																									Medium to coarse grained. Contains much kaolin. One discontinuous lense of black shale 1.3' above base.
0.1-0.5	Sandstone		S	Md lt gy																						Fine to medium grained. Wavy, irregular vitrain layers (up to ½ mm thick).
1.3	Coal		S	Bk	B				X		X	X	D	1.1	26.0	39.2	33.7	3.8	51.6	1.0	3.1	6.7	9575	4	2160	Pinches out to north.
0.85	Sandstone		G	Vy lt gy																						Clay clasts up to 0.3' x 0.1'. Upper 0.4' contains abundant vitrain. Medium to coarse grained.
1.1-2.0	Sandstone		G	Lt gy																						Fine to medium grained.

SITE/STATION NO. 47-7	COUNTY: Westmoreland			COAL SAMPLE NO(S).: 402059/792351/2A, 402059/792351/2B,	
COMPANY: Eidemiller, Inc.	LAT. °N: 40°20'59"	ELEV. (base lower coal): 1142'		402059/792351/2C	
MINE: Strip mine	LONG. °W: 79°23'51"	TWP.: Unity			
PERMIT: 578-15	GEOLOGIST: Reardon	15' QUADRANGLE: Latrobe		JOINTING: Coal cleat: N85E, vert.; N69W, vert. (<½"	
SAMPLING METHOD: Channel	DATE: 6-17-75	7 1/2' QUADRANGLE: Latrobe		spacing); N65E, 84SE; N34W, 87NE; N75W, 86NE (<½" spacing).	
REPORTED COAL NAMES: Bakerstown				WEATHERING: Fresh	Strike and dip on coal: N26E, 6SE.

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
6.0+	Sandstone			Md lt gy																						
10.5	Sandy siltstone		U	Md dk gy																						Plant fossils.
3.8	Coal	1.4	S	Bk	B			X			X	X	MB	1.2	34.6	58.6	5.6	5.3	81.4	1.4	5.1	1.2	14520	8	2400	Band of shale at base.
	Coal	1.2		Bk	B			X				X	M	2.4	28.5	44.9	24.2	4.3	62.7	1.0	6.3	1.5	11170	7½	2660	
	Clayey silt shale	0.1		Dk gy																						
	Coal	1.1		Bk	B			X					B	2.4	30.1	46.5	21.0	4.3	4.2	64.3	1.0	5.2	11690	7½	2190	Dark-gray claystone (<0.1' thick) 0.3' from base.
	Claystone		S	Dk gy																						Slickensides.

SITE/STATION NO. 47-8	COUNTY: Westmoreland		COAL SAMPLE NO(S).: 402139/792411/3A, 402139/792411/3B, 402139/792411/3C, 402139/792411/3D
COMPANY: North Cambria Fuel	LAT °N: 40°21'39"	ELEV. (base lower coal): 1092'	
MINE: Strip mine	LONG. °W: 79°24'11"	TWP.: Unity	
PERMIT: 10-34	GEOLOGIST: Reardon	15' QUADRANGLE: Latrobe	JOINTING: Coal cleat: N69W, 84SW; N67W, 86SW (<½" spacing); N20E, 89SE; N29E, 88SE (<½" spacing). Strike and dip on coal: N8W, 2SW.
SAMPLING METHOD: Channel	DATE: 6-17-75	7 1/2' QUADRANGLE: Latrobe	
REPORTED COAL NAMES: Bakerstown			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
4.0+	Sandstone		U	Lt gy																						
3.8	Coal	1.9		Bk	B		X	X			X	X	MD	1.1	32.2	47.1	19.6	4.5	66.8	1.0	2.2	5.9	12010	8	2130	1
	Carbonaceous clay shale	0.1		Gy bk																						
	Coal	0.5		Bk	B			X				X	M	1.2	33.2	50.6	15.0	4.9	72.2	1.2	5.0	1.7	12910	7½	2460	2
	Silty clay shale	0.1		Gy bk																						
	Coal	0.7		Bk	B			X			X	X	MB	2.0	31.6	46.1	20.3	4.6	66.1	1.1	5.6	2.3	11860	7½	2460	3
	Silty clay shale	0.2		Md dk gy																						Plant fossils.
	Coal	0.3	U	Bk	B			X	X			X	M	3.2	30.7	45.9	20.2	4.5	63.9	0.9	3.0	7.5	11510	8½	2050	4
0.1	Silt-clay laminite shale		G	Dk gy																						Plant fossils.
	Claystone			Md dk gy to dk gy																						Plant fossils.

[1] For trace element analysis, see sample #402139/792411/3D.

[2] For trace element analysis, see sample #402139/792411/3C.

[3] For trace element analysis, see sample #402139/792411/3B.

[4] For trace element analysis, see sample #402139/792411/3A.

SITE/STATION NO. 47-9	COUNTY: Westmoreland		COAL SAMPLE NO(S).: 402506/792349/2A, 2B, 4A, 4B, 4C, 4D, 4E, 4F
COMPANY: Latimer Bros.	LAT. °N: 40°25'06"	ELEV. (base lower coal): 1173'	
MINE: Strip mine	LONG. °W: 79°23'49"	TWP.: Derry	
PERMIT: 955-3	GEOLOGIST: Reardon	15' QUADRANGLE: Latrobe	JOINTING: Coal cleat: N69W, 89SW; N66W, vert.; N33E, 84NW; N26E, 87NW.
SAMPLING METHOD: Channel	DATE: 7-15-75	7 1/2' QUADRANGLE: Saltsburg	
REPORTED COAL NAMES: Pittsburgh			WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S= Sharp, G= Gradational, U= Uncon)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
14+	Clay shale			Gy bk																						Plant fossils. Slickensides.
5.7	Coal	0.9	S	Bk	B				X		X	X	D	4.3	27.2	52.9	15.6	4.6	66.4	1.5	11.2	0.7	11560	1½	2910+	
	Coal	1.0		Bk	B			X	X		X	X	D	3.2	28.8	57.6	10.4	4.9	72.4	1.7	9.6	1.0	12700	1½	2910+	
	Coal	1.0		Bk	B				X		X	X	D	2.0	32.6	61.3	4.1	5.3	80.7	1.9	7.1	0.9	14310	8½	2910+	
	Coal	1.0		Bk	B				X		X	X	D	2.0	31.2	64.2	2.6	5.3	82.1	1.8	7.5	0.7	14530	9	2910+	
	Coal	1.0		Bk	B			X	X		X	X	MB	2.3	29.0	60.0	8.7	4.9	75.9	1.7	8.1	0.7	13430	9	2910+	Band of clay shale at base (0.1' thick).
	Coal	0.8		Bk	B				X			X	MB	2.7	29.9	60.7	6.7	5.1	77.7	1.7	8.0	0.8	13750	9	2910+	
1.1	Carbonaceous clay shale		S	Gy bk																						Few plant fossils.
2.1	Coal	1.1	S	Bk	B			X			X	X	B	2.2	28.8	58.7	10.3	4.9	75.6	1.6	6.8	0.8	13330	7½	2910+	Bands of shale common.
	Coal	1.0		Bk	B			X			X	X	MB	2.3	28.8	57.6	11.3	4.8	73.5	1.5	7.0	1.9	13070	8	2290	Few lenses of pyrite.
	Claystone		S	Dk gy																						Plant fossils.

SITE/STATION NO. 47-10
COMPANY: Latimer Bros.
MINE: Strip mine
PERMIT: 555-3
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Pittsburgh

COUNTY: Westmoreland
LAT. °N: 40°25'18"
LONG. °W: 79°28'55"
GEOLOGIST: Reardon
DATE: 7-15-75

ELEV. (base lower coal): 1182'
TWP.: Derry
15' QUADRANGLE: Latrobe
7 1/2' QUADRANGLE: Saltsburg

COAL SAMPLE NO(S).: 402518/792855/2A, 402518/792855/2B, 402518/792855/2C, 402518/792855/2D
JOINTING: Coal cleat: N71W, vert.; N76W, 87NE; N20E, 85NW; N15E, vert. (<½" spacing). Strike and dip on coal: N41W, 1SW; N38W, 3SW.
WEATHERING: Weathered

STRATIGRAPHIC DATA													COAL ANALYSIS													
					COAL								PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Claroin-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Cover																									
6.6	Coal	2.3		Bk	B				X		X	X	D	16.8	29.8	46.0	7.4	4.9	57.5	1.4	28.3	0.5	9350	0	2210	Band of shale at base (1" thick).
	Coal	1.6		Bk	B			X			X	X	D	17.7	27.2	44.8	10.3	4.4	55.5	1.2	28.2	0.4	8730	0	2190	Thin band of shale at base (<1" thick).
	Coal	1.4		Bk	B			X	X		X	X	D	13.4	26.7	50.0	9.9	4.6	59.3	1.4	24.3	0.5	9670	0	2830	Thin band of shale at base (<1" thick). Very soft, shaly coal.
	Coal	1.3	S	Bk	B		X				X	X	D	16.1	27.1	50.6	6.2	4.8	59.2	1.2	28.0	0.6	9620	0	2730	Very soft, shaly coal.
0.2	Claystone			Lt bn gy																						Plant fossils.

SITE/STATION NO. 48-8
COMPANY: Alice Robinson
MINE: Strip mine
PERMIT: 1258-1
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Upper Freeport
COUNTY: Westmoreland
LAT. °N: 40°09'20"
LONG. °W: 79°25'00"
GEOLOGIST: Gabler
DATE: 6-20-75
ELEV. (base lower coal): 1931'
TWP.: Mt. Pleasant
15' QUADRANGLE: Donegal
7 1/2' QUADRANGLE: Mammoth
COAL SAMPLE NO(S).: 400920/792500/2
JOINTING: Coal cleat: N45W, ~vert.; N40E, 60NW. Joint in claystone above coal: N5E, 85NW. Strike and dip of carbonaceous claystone: N50E, 13SE.
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUN-DANCE				THICK-NESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Cloroin-Durain Luster (bright, mad-bright, mid-lustrous, mad-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5+	Overburden			Lt bn																						
20+	Clay shale			Md gy to dk gy																						
2.3	Carbonaceous claystone			Bk to gy bk																						
3.6	Coal			Bk	B	X					X	X	MB	2.1	29.3	61.8	6.8	5.1	79.9	1.4	5.1	1.7	14050	9	2190	For trace element analysis, see sample #400920/792500/2.
0.1	Claystone			Gy bk to dk gy																						

SITE/STATION NO. 48-9
COMPANY: Brown Coal Co.
MINE: Strip mine
PERMIT: 278-4
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Mahoning?

COUNTY: Westmoreland
LAT. °N: 40°10'57"
LONG. °W: 79°23'08"
GEOLOGIST: Gabler
DATE: 7-18-75
ELEV. (base lower coal): 1933'
TWP.: Donegal
15' QUADRANGLE: Donegal
7 1/2' QUADRANGLE: Mammoth

COAL SAMPLE NO(S).: 401057/792308/7, 401057/792308/9, 401057/792308/11
JOINTING: Coal cleat: N40W, 84NE; N40E, 70NW. Joint in lower sandstone: N70W, 78NE; N40E, vert. Strike and dip of underclay: N40E, 5SE.
WEATHERING: Fresh to weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
~15.0	Sandstone		S	Gy bn																						Fossil remains rare.
2.18	Coal	0.5	G	Bk	B				X			X	MD	15.0	25.8	49.4	9.8	4.9	58.3	1.1	25.3	0.6	9630	0	2620	
	Carbonaceous clay shale	0.15	G	Bk																						
	Coal	1.1	G	Bk	B			X			X	X	M	6.9	29.6	56.2	7.3	4.8	70.6	1.3	15.4	0.6	12040	½	2910+	
	Carbonaceous clay shale	0.03	G	Gy bk to bk																						
	Coal	0.4	G	Bk	B			X		X	X	X	M	5.7	23.4	51.6	19.3	4.1	61.9	1.0	13.1	0.6	10610	1½	2910+	
2.0	Claystone		G	Lt ol gy																						Rootworked.
~4.0	Clay shale		G	Md gy																						
~2.0	Carbonaceous clay shale		S	Dk gy																						
~6.0	Limestone		S	Lt bn																						
3.0	Calcareous clay shale		G	Md bn																						
	Sandstone																									
~8.0	Backfill																									E coal reported as being covered by 8.0' of backfill.
	Coal																									

SITE/STATION NO. 48-10	COUNTY: Westmoreland		COAL SAMPLE NO(S).: 401414/791953/2, 401414/791953/4,
COMPANY: Hawk Bros.	LAT. °N: 40°14'14"	ELEV. (base lower coal): 1753'	401414/791953/6, 401414/791953/8
MINE: Strip mine	LONG. °W: 79°19'53"	TWP.: Ligonier	
PERMIT: 12-11	GEOLOGIST: Gabler	15' QUADRANGLE: Donegal	JOINTING: Coal cleat: N75W, 86SW; N15E, 75NW. Strike and
SAMPLING METHOD: Channel	DATE: 7-7-75	7 1/2' QUADRANGLE: Stahlstown	dip on silt-clay laminite: N20E, 6SE.
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2+	Overburden			Lt bn																						
~17+	Sandy clay shale			Md gy																						
~14	Silt-clay laminite			Dk gy																						
4.51	Coal	0.5	G	Bk	B				X			X	MD	1.3	18.9	42.5	37.3	3.3	51.0	0.8	3.7	3.9	9080	4½	2460	Few pyrite lenses (1-3 mm).
	Bone coal	0.05	G	Bk																						
	Coal	0.7	G	Bk	B			X		X	X	X	M	1.5	19.9	40.8	37.8	3.7	51.4	0.8	5.0	1.3	8980	7	2890	Few pyrite lenses (1-2 mm).
	Carbonaceous clay shale	0.01	G	Gy bk to bk																						
	Coal	0.7	G	Bk	B			X		X	X	X	M	1.3	25.8	61.9	11.0	4.6	76.6	1.2	5.1	1.5	13620	9	2680	Few pyrite lenses (1-2 mm).
	Carbonaceous clay shale	0.05	G	Gy bk to bk																						
	Coal	2.5	S	Bk	B		X			X	X	X	MB	2.4	27.0	63.7	6.9	5.1	78.8	1.4	5.1	2.7	13980	9	2190	Peacock luster.
0.1	Claystone			Md dk gy to dk gy																						

SITE/STATION NO. 57-12		COUNTY: Westmoreland		COAL SAMPLE NO(S).: 401738/791227/2A, 401738/791227/2B, 401738/791227/2C	
COMPANY: Old Home Manor Coal Co.		LAT. °N: 40°17'38"	ELEV. (base lower coal):		
MINE: Strip mine		LONG. °W: 79°12'27"	TWP.: Ligonier		
PERMIT: 615-17		GEOLOGIST: Glover	15' QUADRANGLE: New Florence	JOINTING:	
SAMPLING METHOD: Channel		DATE: 6-23-76	7 1/2' QUADRANGLE: Wilpen		
REPORTED COAL NAMES: Redstone coal				WEATHERING: Fresh	

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60 %	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
15+	Sandstone			Lt gy																						Fine grained.
3.5	Clay shale		S	Lt bn gy																						Plant fragments common.
1.35	Clay shale		S	Bk																						Coaly streaks to 1" thick.
1.1	Clay shale		G	Bn bk																						Few plant fragments.
5.4	Clay shale and bony coal	0.8	S	Bk																						
	Coal	2.0		Bk	B			X				X	D	6.9	24.1	56.8	12.2	5.0	68.9	1.5	11.5	0.9	12120	6	2800+	Blocky fracture. Tough.
	Claystone	0.3		Bk																						
	Coal	1.6		Bk	B		X				X	X	M	3.9	25.6	59.5	11.0	4.9	73.1	1.6	7.9	1.5	13010	9	2800+	
	Clay shale	0.1		Bk																						Tough.
	Coal	0.6		Bk	B		X				X	X	MD	2.8	28.4	59.1	9.7	5.1	75.9	1.6	5.9	1.8	13560	9	2800+	Thin pyrite lenses (1/8" thick).
0.2+	Claystone																									Plastic.

TRACE ELEMENT ANALYSES

Values are in either percent (%) or parts per million (ppm). L after a value means less than the value shown, G means greater than the value shown, N means not detected, B means not determined, and H means not determined due to interference. S after the element heading means that the values listed were determined by semiquantitative spectrographic analysis. These spectrographic results are to be identified with geometric brackets whose boundaries are 1.2, 0.83, 0.56, 0.38, 0.26, 0.18, 0.12, etc., but are reported arbitrarily as midpoints of those brackets, 1.0, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc. The precision of the spectrographic data is within approximately one bracket at 68-percent confidence level, or two brackets at 95-percent confidence level. As, F, Hg, Sb, Se, Th, and U values are from direct determinations on air-dried coal. Values for all other elements were determined by analyses made on the coal ash. Values thought to be interestingly high are underlined.

County	Armstrong	Armstrong	Armstrong	Armstrong
Sample number	405144/793725/2A	405144/793725/2B	404748/793834/2B	404748/793833/2A
Site number	35-20	35-20	35-24	35-25
Ash (%)	14.6	17.1	11.9	9.6
SiO_2 (%)	23.0	26.0	56.9	46.1
Al_2O_3 (%)	14.0	9.3	24.9	24.6
CaO (%)	.62	.56	.40	.57
MgO (%)	.35	.35	1.01	.88
Na_2O (%)	.19	.13	.23	.40
K_2O (%)	.85	.94	2.82	2.56
Fe_2O_3 (%)	50.0	48.0	11.0	18.1
TiO_2 (%)	.80	1.10	1.23	1.19
P_2O_5 (%)	1.00L	1.00L	1.00L	1.00L
SO_3 (%)	2.10	1.50	.73	1.13
Ag (ppm-S)	.65	.79	.46L	.46L
B (ppm-S)	235	186	189	272
Ba (ppm-S)	302	229	323	439
Be (ppm-S)	13	12	30	26
Bi (ppm-S)	4.64L	4.64L	4.64L	4.64L
Cd (ppm)	4.60	9.00	7.40	8.90
Ce (ppm-S)	43L	43L	161	224
Co (ppm-S)	22	18	87	72
Cr (ppm-S)	86	121	177	215
Cu (ppm)	80	38	110	170
Dy (ppm-S)	14.70L	14.70L	14.70L	14.70L
Er (ppm-S)	4.64L	4.64L	23.30	14.90
Eu (ppm-S)	1.00L	1.00L	3.30	3.75
Ga (ppm-S)	49	30	79	76
Gd (ppm-S)	21.50L	21.50L	14.70L	14.70L
Ge (ppm-S)	6	22	50	40
Ho (ppm-S)	3.16L	3.16L	3.16L	3.16L
La (ppm-S)	58	45	50	83
Li (ppm)	88	52	120	95
Mn (ppm-S)	393	178	259	281
Mo (ppm-S)	22	21	38	54
Nb (ppm-S)	20	22	16	16
Nd (ppm-S)	68L	68L	70	68L
Ni (ppm-S)	89	119	376	299
Pb (ppm)	170	230	92	100
Pr (ppm-S)	20.60	15.90	9.75	17.70
Sc (ppm-S)	21	16	33	43
Sm (ppm-S)	6.81L	6.81L	7.39	10.50
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	440	182	286	659
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	97	81	136	133
Y (ppm-S)	59	43	135	128
Yb (ppm-S)	4.14	3.13	9.69	11.20
Zn (ppm-S)	130	77	200	140
Zr (ppm-S)	417.00	383.00	308.00	476.00
As (ppm)	9	23	B	23
F (ppm)	48	46	63	54
Hg (ppm)	.51	.49	.12	.08
Sb (ppm)	.26	.66	B	.89
Se (ppm-S)	2.7	9.7	2.5	1.9
Th (ppm)	7.80	B	B	B
U (ppm)	.49	1.20	.83	.89

County	Armstrong	Armstrong	Armstrong	Armstrong
Sample number	404748/793833/2B	405144/793728/2A	405144/793728/2B	403332/792559/2A
Site number	35-25	35-26	35-26	46-9
Ash (%)	11.8	8.8	7.0	10.4
SiO_2 (%)	27.2	20.0	31.7	24.4
Al_2O_3 (%)	22.8	15.0	19.0	17.3
CaO (%)	.74	1.10	2.00	3.45
MgO (%)	.18	.35	.60	.20
Na_2O (%)	.11	.19	.26	.54
K_2O (%)	.32	.45	.66	.33
Fe_2O_3 (%)	39.2	50.0	36.6	43.0
TiO_2 (%)	.25	.43	1.03	.72
P_2O_5 (%)	1.00L	1.00L	1.00L	2.38
SO_3 (%)	1.52	2.50	3.11	.88
Ag (ppm-S)	.46L	1.01	.63	.57
B (ppm-S)	162	355	328	315
Ba (ppm-S)	328	261	348	526
Be (ppm-S)	29	24	20	11
Bi (ppm-S)	4.64L	4.64L	4.64L	4.64L
Cd (ppm)	5.80	12.00	8.90	.90
Ce (ppm-S)	260	43L	283	43L
Co (ppm-S)	65	19	22	31
Cr (ppm-S)	56	121	115	89
Cu (ppm)	42	98	93	62
Dy (ppm-S)	6.81L	14.70L	6.81L	14.70L
Er (ppm-S)	4.64L	4.64L	4.64L	4.64L
Eu (ppm-S)	1.00L	1.00L	1.00L	2.04
Ga (ppm-S)	15	57	52	30
Gd (ppm-S)	11.40	21.50L	14.70L	21.50L
Ge (ppm-S)	9	3L	4	3L
Ho (ppm-S)	3.16L	3.16L	3.16L	3.16L
La (ppm-S)	48	93	66	51
Li (ppm)	87	130	120	110
Mn (ppm-S)	389	177	324	127
Mo (ppm-S)	40	32	43	26
Nb (ppm-S)	11	18	16	15L
Nd (ppm-S)	68L	68L	68L	68L
Ni (ppm-S)	149	70	89	111
Pb (ppm)	60	180	100	32
Pr (ppm-S)	10.40	22.90	13.00	14.00
Sc (ppm-S)	10	23	30	17
Sm (ppm-S)	4.64L	6.81L	7.71	7.61
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	1460	642	1040	1160
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	63	132	146	106
Y (ppm-S)	72	65	59	53
Yb (ppm-S)	1.73	4.73	4.33	3.86
Zn (ppm-S)	340	130	130	150
Zr (ppm-S)	267.00	98.70	420.00	264.00
As (ppm)	76	3	7	0
F (ppm)	35	35	32	210
Hg (ppm)	.32	.30	.24	.59
Sb (ppm)	1.08	.21	.19	B
Se (ppm-S)	1.4	3.5	5.3	7.6
Th (ppm)	B	B	B	B
U (ppm)	B	.38	.38	.60

County	Armstrong	Armstrong	Armstrong	Butler
Sample number	403332/792559/2B	403332/792559/4	403332/792559/5	410542/794746/2B
Site number	46-9	46-9	46-9	24-18
Ash (%)	15.1	36.9	33.8	9.3
SiO_2 (%)	49.0	46.7	36.0	32.9
Al_2O_3 (%)	26.2	25.2	23.5	25.8
CaO (%)	.39	.22	.12	4.30
MgO (%)	.53	.70	.55	.46
Na_2O (%)	.50	.24	.35	.15
K_2O (%)	1.70	2.91	1.86	.87
Fe_2O_3 (%)	10.1	13.6	27.6	25.7
TiO_2 (%)	1.42	1.08	.63	.90
P_2O_5 (%)	.10L	.10L	.10L	2.63
SO_3 (%)	.14	.10L	.10L	2.45
Ag (ppm-S)	.46L	.46L	.46L	1.12
B (ppm-S)	268	148	124	464G
Ba (ppm-S)	294	332	343	1190
Be (ppm-S)	7	7	8	17
Bi (ppm-S)	4.64L	4.64L	5.75	4.64L
Cd (ppm)	1.00	1.30	1.20	9.40
Ce (ppm-S)	131	125	206	396
Co (ppm-S)	22	18	63	86
Cr (ppm-S)	105	132	103	261
Cu (ppm)	65	84	70	150
Dy (ppm-S)	14.70L	14.70L	14.70L	14.70L
Er (ppm-S)	4.64L	5.80	7.75	21.10
Eu (ppm-S)	1.40	1.86	2.70	3.01
Ga (ppm-S)	32	42	39	69
Gd (ppm-S)	21.50L	21.50L	21.50L	14.70L
Ge (ppm-S)	3L	4	3L	4
Ho (ppm-S)	3.16L	3.16L	3.16L	3.16L
La (ppm-S)	42	31	52	190
Li (ppm)	180	170	260	220
Mn (ppm-S)	102	104	123	249
Mo (ppm-S)	2L	3	6	38
Nb (ppm-S)	15L	15L	15L	34
Nd (ppm-S)	68L	68L	68L	138
Ni (ppm-S)	71	72	134	102
Pb (ppm)	48	52	27	120
Pr (ppm-S)	10.00L	10.00L	10.80	24.70
Sc (ppm-S)	16	20	17	32
Sm (ppm-S)	6.81L	6.81L	6.82	21.50
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	164	98	98	3900
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	107	124	164	303
Y (ppm-S)	30	26	39	123
Yb (ppm-S)	4.83	5.65	4.91	5.34
Zn (ppm-S)	250	110	410	92
Zr (ppm-S)	147.00	166.00	205.00	843.00
As (ppm)	0	0	0	16
F (ppm)	84	210	120	290
Hg (ppm)	.16	.46	.83	.42
Sb (ppm)	B	B	B	.25
Se (ppm-S)	1.5	4.9	7.9	5.7
Th (ppm)	B	12.51	8.07	20.49
U (ppm)	1.34	2.34	2.87	.61

County	Butler	Butler	Butler	Butler
Sample number	410542/794746/2C	405158/794644/2A	405158/794644/2B	405535/794525/2A
Site number	24-18	25-7	25-7	25-8
Ash (%)	8.5	10.8	9.5	16.0
SiO_2 (%)	31.3	44.5	33.5	55.0
Al_2O_3 (%)	15.5	27.6	24.7	26.0
CaO (%)	1.90	1.22	1.76	.27
MgO (%)	.50	.89	1.01	1.28
Na_2O (%)	.19	.45	.27	.63
K_2O (%)	1.05	3.07	2.78	3.30
Fe_2O_3 (%)	38.6	11.6	25.2	8.1
TiO_2 (%)	1.08	1.25	.85	1.20
P_2O_5 (%)	1.00L	.80	.47	1.00L
SO_3 (%)	2.48	.56	1.12	1.10
Ag (ppm-S)	.59	.54	.47	.91
B (ppm-S)	272	252	284	231
Ba (ppm-S)	671	917	385	620
Be (ppm-S)	34	13	10	21
Bi (ppm-S)	4.64L	4.64L	4.64L	4.64L
Cd (ppm)	5.60	.14	.32	5.40
Ce (ppm-S)	311	192	131	162
Co (ppm-S)	61	29	23	61
Cr (ppm-S)	123	158	88	214
Cu (ppm)	104	93	180	360
Dy (ppm-S)	6.81L	14.70L	14.70L	14.70L
Er (ppm-S)	12.70	5.00	4.64L	12.20
Eu (ppm-S)	1.81	4.03	1.46	4.57
Ga (ppm-S)	73	57	45	111
Gd (ppm-S)	14.70L	21.50L	21.50L	21.50L
Ge (ppm-S)	40	3L	3L	102
Ho (ppm-S)	3.16L	3.16L	3.16L	14.70L
La (ppm-S)	77	75	27	92
Li (ppm)	120	160	230	230
Mn (ppm-S)	257	115	118	167
Mo (ppm-S)	33	31	18	59
Nb (ppm-S)	18	15L	15L	15L
Nd (ppm-S)	68L	68L	68L	68L
Ni (ppm-S)	150	121	75	300
Pb (ppm)	280	65	77	150
Pr (ppm-S)	16.90	13.30	10.00L	14.90
Sc (ppm-S)	36	24	10	36
Sm (ppm-S)	8.75	8.35	6.81L	7.04
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	1090	865	335	362
Tl (ppm-S)	4.64L	4.64L	35.40	4.64L
V (ppm-S)	102	158	117	440
Y (ppm-S)	108	45	27	78
Yb (ppm-S)	6.41	9.04	5.52	10.40
Zn (ppm-S)	94	86	85	310
Zr (ppm-S)	461.00	85.40	49.50	178.00
As (ppm)	47	0	0	11
F (ppm)	93	120	110	100
Hg (ppm)	.68	.15	.82	.20
Sb (ppm)	1.09	B	B	4.76
Se (ppm-S)	4.5	1.1	1.4	3.0
Th (ppm)	B	B	B	14.04
U (ppm)	.50	1.04	.72	2.31

County	Butler	Butler	Butler	Butler
Sample number	405535/794525/2B	405535/794525/4A	405535/794525/4B	405538/794529/2A
Site number	25-8	25-8	25-8	25-9
Ash (%)	20.9	6.8	8.1	13.8
SiO_2 (%)	51.0	36.0	40.9	56.9
Al_2O_3 (%)	31.0	30.0	32.6	24.9
CaO (%)	.36	3.30	4.90	.57
MgO (%)	1.66	.66	.66	1.38
Na_2O (%)	.82	.53	.30	.36
K_2O (%)	3.90	2.00	1.93	3.18
Fe_2O_3 (%)	5.6	19.0	7.1	9.0
TiO_2 (%)	1.20	.97	1.28	1.28
P_2O_5 (%)	1.00L	2.90	4.23	1.00L
SO_3 (%)	1.10	2.80	3.10	1.39
Ag (ppm-S)	1.01	.87	1.67	.97
B (ppm-S)	209	398	385	237
Ba (ppm-S)	596	1420	2150G	383
Be (ppm-S)	11	17	45	38
Bi (ppm-S)	4.64L	4.64L	7.88	4.64L
Cd (ppm)	2.00	2.20	11.00	9.40
Ce (ppm-S)	147	226	544	193
Co (ppm-S)	34	24	51	178
Cr (ppm-S)	222	139	294	217
Cu (ppm)	290	390	860	230
Dy (ppm-S)	14.70L	14.70L	43.40	37.10
Er (ppm-S)	6.36	10.70	26.60	27.40
Eu (ppm-S)	4.12	6.86	19.70	5.06
Ga (ppm-S)	97	52	136	174
Gd (ppm-S)	21.50L	25.10	43.70	14.70L
Ge (ppm-S)	12	4	12	322
Ho (ppm-S)	6.78	3.16L	8.66	6.17
La (ppm-S)	53	88	266	93
Li (ppm)	300	160	200	190
Mn (ppm-S)	184	81	190	302
Mo (ppm-S)	22	28	40	191
Nb (ppm-S)	15L	15L	10L	19
Nd (ppm-S)	70	68L	304	68L
Ni (ppm-S)	190	177	313	540
Pb (ppm)	170	150	180	170
Pr (ppm-S)	10.90	19.50	58.00	15.60
Sc (ppm-S)	34	23	69	50
Sm (ppm-S)	7.14	10.70	29.00	10.60
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	307	2150G	6310	517
Tl (ppm-S)	4.64L	4.64L	10.40	4.64L
V (ppm-S)	335	272	519	220
Y (ppm-S)	33	64	181	164
Yb (ppm-S)	9.53	10.90	14.50	9.70
Zn (ppm-S)	280	86	100	510
Zr (ppm-S)	130.00	68.40	510.00	668.00
As (ppm)	12	39	10	16
F (ppm)	150	170	260	69
Hg (ppm)	.13	.26	.20	.17
Sb (ppm)	2.03	.79	1.10	8.80
Se (ppm-S)	2.4	2.0	2.6	2.0
Th (ppm)	16.14	6.29	B	B
U (ppm)	2.56	1.09	2.20	1.35

County	Butler	Butler	Butler	Butler
Sample number	405538/794529/2B	405538/794529/2C	405538/794529/4A	405538/794529/4B
Site number	25-9	25-9	25-9	25-9
Ash (%)	17.1	19.0	6.8	29.6
SiO_2 (%)	55.7	52.2	34.7	52.4
Al_2O_3 (%)	29.5	27.6	28.0	28.8
CaO (%)	.37	.35	4.30	.58
MgO (%)	1.31	1.64	.56	1.28
Na_2O (%)	.27	.35	.23	.36
K_2O (%)	3.33	3.96	1.85	3.28
Fe_2O_3 (%)	6.9	6.1	20.5	6.2
TiO_2 (%)	1.29	1.10	.90	1.35
P_2O_5 (%)	1.00L	1.00L	3.65	1.00L
SO_3 (%)	1.20	1.31	3.15	1.15
Ag (ppm-S)	.65	1.01	1.44	.46L
B (ppm-S)	197	189	424	169
Ba (ppm-S)	518	599	1240	1020
Be (ppm-S)	26	15	25	26
Bi (ppm-S)	4.64L	4.64L	11.00	5.13
Cd (ppm)	8.80	9.70	6.50	2.40
Ce (ppm-S)	257	236	488	378
Co (ppm-S)	50	55	67	29
Cr (ppm-S)	190	219	170	257
Cu (ppm)	410	360	520	490
Dy (ppm-S)	35.90	21.60	47.10	46.40
Er (ppm-S)	23.00	16.20	38.10	25.90
Eu (ppm-S)	6.03	5.62	12.90	10.40
Ga (ppm-S)	75	134	72	102
Gd (ppm-S)	34.90	32.30	58.70	40.30
Ge (ppm-S)	3	3	5	15
Ho (ppm-S)	3.73	3.39	3.16L	6.49
La (ppm-S)	160	132	212	228
Li (ppm)	260	280	170	370
Mn (ppm-S)	283	305	101	302
Mo (ppm-S)	100	33	103	20
Nb (ppm-S)	28	10	17	29
Nd (ppm-S)	148	141	307	255
Ni (ppm-S)	317	270	447	206
Pb (ppm)	160	140	240	120
Pr (ppm-S)	21.70	18.90	33.00	31.30
Sc (ppm-S)	40	68	39	48
Sm (ppm-S)	17.10	15.10	24.40	23.30
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	1140	849	2150G	2190
Tl (ppm-S)	4.64L	4.64L	4.64L	6.52
V (ppm-S)	382	308	381	490
Y (ppm-S)	146	88	290	200
Yb (ppm-S)	8.88	10.40	22.00	14.20
Zn (ppm-S)	220	270	100	94
Zr (ppm-S)	643.00	313.00	549.00	601.00
As (ppm)	14	17	41	25
F (ppm)	110	150	210	270
Hg (ppm)	.09	.09	.22	.21
Sb (ppm)	2.60	2.10	.95	2.90
Se (ppm-S)	3.1	1.8	3.1	1.6
Th (ppm)	9.53	12.09	B	B
U (ppm)	2.73	2.35	1.50	B

County	Butler	Butler	Butler	Butler
Sample number	410906/794409/2A	410906/794409/2B	410906/794409/2C	410906/794409/2D
Site number	34-23	34-23	34-23	34-23
Ash (%)	27.5	6.8	7.2	11.0
SiO_2 (%)	32.2	19.9	12.2	44.0
Al_2O_3 (%)	20.7	12.8	9.9	14.2
CaO (%)	.62	1.70	2.10	.73
MgO (%)	.33	.53	.38	.55
Na_2O (%)	.11	.30	.18	.18
K_2O (%)	.75	1.07	.30	1.24
Fe_2O_3 (%)	32.0	51.4	60.0	33.6
TiO_2 (%)	.54	.74	.33	1.24
P_2O_5 (%)	1.00L	1.00L	1.00L	1.00L
SO_3 (%)	2.03	3.49	3.34	1.45
Ag (ppm-S)	.46L	1.08	1.15	1.35
B (ppm-S)	251	464G	464G	406
Ba (ppm-S)	621	206	245	230
Be (ppm-S)	28	42	10	29
Bi (ppm-S)	4.64L	4.64L	4.64L	4.64L
Cd (ppm)	13.00	6.70	14.00	10.00
Ce (ppm-S)	660	43L	43L	274
Co (ppm-S)	1000G	156	37	12
Cr (ppm-S)	82	152	41	117
Cu (ppm)	56	95	70	78
Dy (ppm-S)	34.50	14.70L	6.81L	6.81L
Er (ppm-S)	41.60	30.40	4.64L	4.64L
Eu (ppm-S)	5.53	3.28	1.81	1.51
Ga (ppm-S)	26	51	41	62
Gd (ppm-S)	37.80	14.70L	14.70L	26.70
Ge (ppm-S)	7	4	3L	22
Ho (ppm-S)	15.20	3.16L	3.16L	3.16L
La (ppm-S)	343	5L	5L	58
Li (ppm)	220	84	110	100
Mn (ppm-S)	461	308	182	180
Mo (ppm-S)	19	46	35	85
Nb (ppm-S)	11	24	18	41
Nd (ppm-S)	250	68L	68L	68L
Ni (ppm-S)	1000G	206	81	54
Pb (ppm)	44	52	60	92
Pr (ppm-S)	38.90	16.50	31.60L	11.80
Sc (ppm-S)	18	26	22	32
Sm (ppm-S)	35.90	9.66	4.64L	7.87
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	2150G	666	955	533
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	133	164	114	198
Y (ppm-S)	H	306	47	93
Yb (ppm-S)	5.57	22.00	3.29	8.60
Zn (ppm-S)	3900	275	210	93
Zr (ppm-S)	740.00	675.00	727.00	663.00
As (ppm)	10	2	1	2
F (ppm)	150	20	20	42
Hg (ppm)	.37	.21	.22	.21
Sb (ppm)	.29	.14	.11	.20
Se (ppm-S)	4.8	1.3	3.1	5.4
Th (ppm)	7.26	B	B	B
U (ppm)	.67	.43	.49	1.25

County	Butler	Clearfield	Clearfield	Clearfield
Sample number	410906/794410/2D	410131/783854	410132/783857	410145/784318
Site number	34-24	74-29	74-29	74-30
Ash (%)	5.5	13.4	4.4	11.3
SiO_2 (%)	31.2	42.0	32.6	48.8
Al_2O_3 (%)	21.0	19.1	17.7	25.9
CaO (%)	2.00	.46	2.10	1.50
MgO (%)	.42	.45	.80	1.11
Na_2O (%)	.23	.07	.20	.22
K_2O (%)	.41	.64	1.12	2.09
Fe_2O_3 (%)	35.6	20.5	31.0	12.4
TiO_2 (%)	.80	1.40	1.11	.92
P_2O_5 (%)	1.00L	1.00L	1.00L	1.00L
SO_3 (%)	3.03	.47	3.83	1.77
Ag (ppm-S)	.57	.47	1.83	.54
B (ppm-S)	464G	41	100	71
Ba (ppm-S)	265	245	2400	440
Be (ppm-S)	44	25	87	37
Bi (ppm-S)	4.64L	4.64L	4.64L	4.64L
Cd (ppm)	10.00	4.10	11.00	8.80
Ce (ppm-S)	347	298	310	225
Co (ppm-S)	1000G	20	207	92
Cr (ppm-S)	105	178	160	141
Cu (ppm)	98	150	200	180
Dy (ppm-S)	6.81L	14.70L	6.81L	39.90
Er (ppm-S)	4.64L	17.30	29.80	13.10
Eu (ppm-S)	2.27	3.47	4.43	4.19
Ga (ppm-S)	87	48	191	76
Gd (ppm-S)	14.70L	14.70L	49.70	27.00
Ge (ppm-S)	48	23	141	70
Ho (ppm-S)	3.16L	7.66	14.30	6.50
La (ppm-S)	88	107	74	88
Li (ppm)	140	150	120	190
Mn (ppm-S)	300	197	323	138
Mo (ppm-S)	63	47	168	52
Nb (ppm-S)	14	33	36	18
Nd (ppm-S)	68L	68L	68L	77
Ni (ppm-S)	1020	103	792	143
Pb (ppm)	68	130	310	140
Pr (ppm-S)	16.30	19.60	18.50	14.10
Sc (ppm-S)	32	34	31	35
Sm (ppm-S)	11.40	14.80	13.20	12.60
Sn (ppm-S)	14.70L	14.70L	15.70	14.70L
Sr (ppm-S)	1450	540	1980	893
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	158	207	230	230
Y (ppm-S)	139	90	281	128
Yb (ppm-S)	6.02	4.95	16.00	7.29
Zn (ppm-S)	260	87	400	310
Zr (ppm-S)	418.00	771.00	673.00	519.00
As (ppm)	2	5	15	40
F (ppm)	31	42	48	78
Hg (ppm)	.11	.47	.20	.08
Sb (ppm)	.22L	.41	1.37	1.44
Se (ppm-S)	4.6	8.4	1.1	3.5
Th (ppm)	B	10.79	B	9.23
U (ppm)	.73	4.67	B	B

County	Clearfield	Clearfield	Clearfield	Clearfield
Sample number	410146/784316	410215/783901	405737/783505/1A	405737/783505/1B
Site number	74-30	74-33	75-21	75-21
Ash (%)	8.5	13.3	25.3	27.6
SiO_2 (%)	50.7	52.4	42.6	45.8
Al_2O_3 (%)	30.2	26.3	22.7	27.4
CaO (%)	2.00	.67	.46	.57
MgO (%)	.91	.43	.66	.68
Na_2O (%)	.24	.09	.18	.19
K_2O (%)	1.76	.65	1.45	1.69
Fe_2O_3 (%)	4.1	12.8	18.8	18.7
TiO_2 (%)	1.42	1.61	1.48	1.27
P_2O_5 (%)	1.00L	1.00L	1.00L	1.00L
SO_3 (%)	2.74	.99	.87	1.24
Ag (ppm-S)	1.31	.46L	.46L	.46L
B (ppm-S)	131	65	78	79
Ba (ppm-S)	1490	268	527	617
Be (ppm-S)	42	30	28	31
Bi (ppm-S)	6.57	4.64L	4.64L	4.64L
Cd (ppm)	5.50	6.30	5.50	7.30
Ce (ppm-S)	341	238	317	405
Co (ppm-S)	30	21	375	225
Cr (ppm-S)	322	183	152	214
Cu (ppm)	110	170	84	100
Dy (ppm-S)	25.70	14.70L	21.20	33.30
Er (ppm-S)	11.90	18.30	20.40	21.10
Eu (ppm-S)	4.45	3.89	2.90	3.57
Ga (ppm-S)	106	65	68	71
Gd (ppm-S)	16.40	21.10	14.70L	32.00
Ge (ppm-S)	12	26	6	8
Ho (ppm-S)	4.16	3.16L	3.16L	3.16L
La (ppm-S)	171	101	148	229
Li (ppm)	390	210	320	260
Mn (ppm-S)	2300	233	591	1010
Mo (ppm-S)	26	42	14	15
Nb (ppm-S)	17	34	37	35
Nd (ppm-S)	173	68L	156	153
Ni (ppm-S)	85	103	321	337
Pb (ppm)	120	220	120	110
Pr (ppm-S)	22.40	16.70	18.50	25.30
Sc (ppm-S)	38	35	26	33
Sm (ppm-S)	19.20	14.90	16.50	25.80
Sn (ppm-S)	14.70L	14.70L	14.70L	65.80
Sr (ppm-S)	2700	764	1010	1780
Tl (ppm-S)	5.28	4.64L	4.64L	4.64L
V (ppm-S)	387	240	212	360
Y (ppm-S)	88	99	122	188
Yb (ppm-S)	10.00	5.83	5.63	5.97
Zn (ppm-S)	150	140	270	1200
Zr (ppm-S)	408.00	677.00	756.00	679.00
As (ppm)	2	5	10	8
F (ppm)	100	38	98	130
Hg (ppm)	.28	.12	.23	.22
Sb (ppm)	.26	.57	.68	.81
Se (ppm-S)	3.2	7.0	9.5	8.3
Th (ppm)	B	B	8.26	10.80
U (ppm)	1.32	3.59	1.69	2.21

County	Clearfield	Clearfield	Clearfield	Clearfield
Sample number	405735/783503/3	405600/783923	410512/781715	410514/781709
Site number	75-21	75-24	84-11	84-12
Ash (%)	29.3	10.0	11.8	10.0
SiO_2 (%)	28.2	47.0	22.0	26.0
Al_2O_3 (%)	15.7	21.4	19.0	24.0
CaO (%)	.13	1.20	1.60	1.70
MgO (%)	.53	1.33	.34	.44
Na_2O (%)	.11	.31	.12	.22
K_2O (%)	1.43	2.76	.61	.84
Fe_2O_3 (%)	44.5	7.6	37.0	26.0
TiO_2 (%)	.73	.99	1.20	1.00
P_2O_5 (%)	1.00L	1.00L	.13	.20
SO_3 (%)	1.40	1.76	.48	.48
Ag (ppm-S)	.67	.46L	1.03	1.03
B (ppm-S)	59	101	56	74
Ba (ppm-S)	400	868	218	287
Be (ppm-S)	9	18	12	17
Bi (ppm-S)	4.64L	4.64L	4.64L	4.64L
Cd (ppm)	13.00	7.80	4.40	5.60
Ce (ppm-S)	43L	207	43L	234
Co (ppm-S)	744	136	21	23
Cr (ppm-S)	98	183	97	129
Cu (ppm)	68	89	315	344
Dy (ppm-S)	6.81L	14.70L	6.81L	6.81L
Er (ppm-S)	4.64L	17.00	4.64L	4.64L
Eu (ppm-S)	2.27	4.70	1.00L	1.93
Ga (ppm-S)	41	62	44	50
Gd (ppm-S)	14.70L	14.70L	14.70L	14.70L
Ge (ppm-S)	4	9	24	61
Ho (ppm-S)	3.16L	4.04	3.16L	3.16L
La (ppm-S)	5L	98	5L	70
Li (ppm)	140	140	217	312
Mn (ppm-S)	456	893	90	105
Mo (ppm-S)	89	91	36	19
Nb (ppm-S)	18	14	17	18
Nd (ppm-S)	68L	100L	68L	68L
Ni (ppm-S)	763	147	65	101
Pb (ppm)	170	64	113	127
Pr (ppm-S)	16.40	16.70	13.70	12.80
Sc (ppm-S)	19	29	27	32
Sm (ppm-S)	11.70	12.30	8.35	9.74
Sn (ppm-S)	14.70L	14.70L	54.30	19.80
Sr (ppm-S)	511	2080	1230	2480
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	148	193	154	195
Y (ppm-S)	66	88	49	70
Yb (ppm-S)	3.96	7.13	3.65	4.71
Zn (ppm-S)	2200	200	100	186
Zr (ppm-S)	543.00	310.00	447.00	387.00
As (ppm)	122	3	13	3
F (ppm)	140	110	47	48
Hg (ppm)	3.20	.11	.27	.25
Sb (ppm)	1.85	.46	.86	.23
Se (ppm-S)	16.9	1.5	9.6	7.7
Th (ppm)	15.55	B	B	5.08
U (ppm)	3.99	.64	.86	1.12

County	Clearfield	Clearfield	Clearfield	Clearfield
Sample number	404502/782301/1	404502/782301/2	404502/782301/3	404502/782301/4
Site number	85-11	85-11	85-11	85-11
Ash (%)	17.5	13.8	22.8	9.5
SiO_2 (%)	24.2	50.7	37.0	43.4
Al_2O_3 (%)	16.5	28.9	24.9	31.3
CaO (%)	.55	.56	.39	.94
MgO (%)	.25	.65	.35	.71
Na_2O (%)	.13	.16	.08	.22
K_2O (%)	.56	1.93	1.03	1.59
Fe_2O_3 (%)	48.7	8.5	29.0	12.4
TiO_2 (%)	.96	1.50	1.62	1.49
P_2O_5 (%)	1.00L	1.00L	1.00L	1.00L
SO_3 (%)	1.33	.99	.99	2.00
Ag (ppm-S)	.76	.89	.79	.54
B (ppm-S)	35	100	25	100
Ba (ppm-S)	122	542	209	664
Be (ppm-S)	6	29	23	18
Bi (ppm-S)	4.64L	7.16	4.64L	4.64L
Cd (ppm)	11.00	6.90	14.00	6.60
Ce (ppm-S)	462	254	278	233
Co (ppm-S)	35	108	178	44
Cr (ppm-S)	124	293	177	213
Cu (ppm)	110	170	160	120
Dy (ppm-S)	6.81L	40.70	48.50	6.81L
Er (ppm-S)	4.64L	14.80	31.10	4.64L
Eu (ppm-S)	1.00L	4.58	5.34	4.08
Ga (ppm-S)	37	106	104	72
Gd (ppm-S)	14.70L	32.10	35.20	14.70L
Ge (ppm-S)	3L	13	42	8
Ho (ppm-S)	3.16L	3.16L	3.16L	5.93
La (ppm-S)	85	120	54	94
Li (ppm)	220	300	250	400
Mn (ppm-S)	87	252	51	387
Mo (ppm-S)	114	50	15	15
Nb (ppm-S)	28	52	31	28
Nd (ppm-S)	68L	100	68L	100L
Ni (ppm-S)	121	167	251	103
Pb (ppm)	150	200	140	130
Pr (ppm-S)	17.70	19.70	13.40	15.70
Sc (ppm-S)	33	41	39	37
Sm (ppm-S)	11.80	16.60	10.60	11.80
Sn (ppm-S)	14.70L	14.70L	14.70L	15.00
Sr (ppm-S)	248	906	186	696
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	166	279	251	204
Y (ppm-S)	50	137	200	87
Yb (ppm-S)	5.60	7.74	11.50	5.17
Zn (ppm-S)	81	200	370	150
Zr (ppm-S)	774.00	999.00	706.00	418.00
As (ppm)	182	24	33	12
F (ppm)	51	76	65	54
Hg (ppm)	1.50	.11	.87	.09
Sb (ppm)	2.07	.55	7.63	.38
Se (ppm-S)	16.5	4.6	12.6	7.1
Th (ppm)	B	B	B	B
U (ppm)	1.24	1.52	1.93	.81

County	Clearfield	Clearfield	Clearfield	Clearfield
Sample number	404506/782307/1	404506/782307/2	404506/782307/4	405735/782503
Site number	85-11	85-11	85-11	85-12
Ash (%)	17.9	8.5	12.9	17.5
SiO_2 (%)	47.9	50.7	49.8	41.7
Al_2O_3 (%)	29.7	34.5	30.5	24.7
CaO (%)	.55	1.10	.92	.68
MgO (%)	.60	.65	.96	.51
Na_2O (%)	.11	.18	.28	.13
K_2O (%)	1.51	1.67	2.22	1.17
Fe_2O_3 (%)	15.0	2.5	5.1	21.1
TiO_2 (%)	1.69	1.30	1.60	1.01
P_2O_5 (%)	1.00L	1.00L	1.00L	1.00L
SO_3 (%)	1.03	1.15	1.93	.55
Ag (ppm-S)	.78	1.43	.46L	.48
B (ppm-S)	75	79	111	42
Ba (ppm-S)	245	344	393	379
Be (ppm-S)	10	32	12	21
Bi (ppm-S)	4.64L	4.64L	4.64L	4.64L
Cd (ppm)	7.30	7.50	6.90	9.60
Ce (ppm-S)	181	284	195	198
Co (ppm-S)	24	80	36	27
Cr (ppm-S)	207	234	151	118
Cu (ppm)	97	120	140	130
Dy (ppm-S)	6.81L	24.20	14.70L	6.81L
Er (ppm-S)	4.64L	21.70	17.00	4.64L
Eu (ppm-S)	2.16	5.15	4.04	1.08
Ga (ppm-S)	60	96	49	79
Gd (ppm-S)	17.10	27.90	14.70L	14.70L
Ge (ppm-S)	3L	12	3L	30
Ho (ppm-S)	3.16L	4.19	3.16L	3.16L
La (ppm-S)	70	123	93	65
Li (ppm)	300	260	360	300
Mn (ppm-S)	292	80	204	120
Mo (ppm-S)	32	119	6	14
Nb (ppm-S)	16	26	22	22
Nd (ppm-S)	68L	123	68L	68L
Ni (ppm-S)	98	147	132	117
Pb (ppm)	150	100	150	130
Pr (ppm-S)	11.40	21.80	15.10	12.10
Sc (ppm-S)	30	39	32	31
Sm (ppm-S)	7.94	21.90	11.40	7.43
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	364	1020	686	485
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	161	201	160	203
Y (ppm-S)	37	142	70	64
Yb (ppm-S)	4.56	7.74	6.24	3.04
Zn (ppm-S)	140	170	160	150
Zr (ppm-S)	199.00	708.00	457.00	548.00
As (ppm)	26	2	2	16
F (ppm)	82	42	88	58
Hg (ppm)	.21	.06	.02	.18
Sb (ppm)	.87	.31	.45	1.20
Se (ppm-S)	8.0	2.5	8.1	5.6
Th (ppm)	B	B	B	B
U (ppm)	1.82	.93	.94	1.01

County	Clearfield	Elk	Elk	Elk
Sample number	405738/782504	411708/784629/1A	411708/784629/2A	411706/784628
Site number	85-12	63-1	63-1	63-1
Ash (%)	17.0	8.2	10.7	11.0
SiO_2 (%)	27.8	26.0	39.0	49.0
Al_2O_3 (%)	17.5	19.0	20.0	24.0
CaO (%)	.73	1.90	.84	.75
MgO (%)	.38	.38	.55	.70
Na_2O (%)	.08	.27	.26	.35
K_2O (%)	.94	.48	1.40	1.90
Fe_2O_3 (%)	43.1	41.0	26.0	18.0
TiO_2 (%)	.77	.83	1.40	1.30
P2O5 (%)	1.00L	1.00L	1.00L	1.00L
SO_3 (%)	1.42	3.50	2.00	1.80
Ag (ppm-S)	.68	.94	.71	.79
B (ppm-S)	58	320	149	185
Ba (ppm-S)	253	341	2150G	480
Be (ppm-S)	18	12	16	14
Bi (ppm-S)	4.64L	4.64L	4.64L	7.39
Cd (ppm)	7.30	6.00	3.80	4.20
Ce (ppm-S)	331	190	43L	43L
Co (ppm-S)	40	15	35	26
Cr (ppm-S)	158	60	144	176
Cu (ppm)	87	190	140	100
Dy (ppm-S)	6.81L	14.70L	14.70L	14.70L
Er (ppm-S)	4.64L	8.33	4.64L	9.60
Eu (ppm-S)	1.00L	1.00L	2.28	3.25
Ga (ppm-S)	56	64	57	63
Gd (ppm-S)	14.70L	21.50L	21.50L	21.50L
Ge (ppm-S)	7	14	49	69
Ho (ppm-S)	3.16L	3.16L	3.16L	3.16L
La (ppm-S)	62	40	54	60
Li (ppm)	160	130	170	180
Mn (ppm-S)	136	142	168	135
Mo (ppm-S)	40	9	28	30
Nb (ppm-S)	30	15L	15L	15L
Nd (ppm-S)	68L	68L	68L	68L
Ni (ppm-S)	111	42	107	117
Pb (ppm)	190	170	170	84
Pr (ppm-S)	18.20	10.90	12.10	12.30
Sc (ppm-S)	31	15	19	22
Sm (ppm-S)	9.96	6.81L	6.81L	6.81L
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	511	637	471	298
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	197	82	146	165
Y (ppm-S)	84	30	49	56
Yb (ppm-S)	7.30	2.88	8.63	11.30
Zn (ppm-S)	71	51	110	77
Zr (ppm-S)	587.00	64.40	86.30	90.10
As (ppm)	50	10	45	39
F (ppm)	45	30	46	41
Hg (ppm)	.69	.87	.72	.81
Sb (ppm)	.83	.28	1.39	1.53
Se (ppm-S)	12.3	8.3	3.7	4.9
Th (ppm)	B	B	6.19	B
U (ppm)	1.11	1.22	1.16	.72

County	Elk	Elk	Elk	Fayette
Sample number	411935/784205/1	411935/784205/2	411937/784204	395109/795232/2
Site number	73-11	73-11	73-11	29-11
Ash (%)	10.6	8.4	12.8	24.0
SiO_2 (%)	48.0	26.0	52.0	53.7
Al_2O_3 (%)	22.0	16.0	23.0	23.6
CaO (%)	2.50	6.90	.89	.33
MgO (%)	.75	1.39	.76	.85
Na_2O (%)	.24	.15	.34	.43
K_2O (%)	1.80	1.10	2.20	3.25
Fe_2O_3 (%)	14.0	30.0	7.9	6.9
TiO_2 (%)	1.30	.94	1.50	1.25
P_2O_5 (%)	1.00L	1.00L	1.00L	.10L
SO_3 (%)	4.40	13.00	1.30	.10L
Ag (ppm-S)	.46L	1.12	.46L	.46L
B (ppm-S)	199	134	182	170
Ba (ppm-S)	840	1720	891	677
Be (ppm-S)	20	50	24	13
Bi (ppm-S)	4.69	4.64L	4.64L	4.64L
Cd (ppm)	5.40	4.30	2.60	.16
Ce (ppm-S)	197	63L	97	95
Co (ppm-S)	25	51	18	10
Cr (ppm-S)	190	84	226	164
Cu (ppm)	66	220	72	22
Dy (ppm-S)	14.70L	14.70L	33.10	14.70L
Er (ppm-S)	11.80	18.30	7.49	4.64L
Eu (ppm-S)	3.14	1.92	3.83	1.41
Ga (ppm-S)	62	92	78	58
Gd (ppm-S)	21.50L	21.50L	21.50L	21.50L
Ge (ppm-S)	39	89	57	64
Ho (ppm-S)	3.16L	68.10L	7.20	14.70L
La (ppm-S)	80	63	43	39
Li (ppm)	190	66	170	120
Mn (ppm-S)	2890	345	1370	76
Mo (ppm-S)	36	44	15	6
Nb (ppm-S)	23	19	15L	15L
Nd (ppm-S)	68L	68L	68L	68L
Ni (ppm-S)	112	119	77	36
Pb (ppm)	88	180	58	30
Pr (ppm-S)	14.90	14.90	10.00L	10.00L
Sc (ppm-S)	31	29	22	28
Sm (ppm-S)	8.29	8.90	6.81L	6.81L
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	769	473	1230	185
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	211	154	195	205
Y (ppm-S)	80	147	48	31
Yb (ppm-S)	10.40	12.10	12.30	5.81
Zn (ppm-S)	160	130	110	79
Zr (ppm-S)	255.00	257.00	116.00	213.00
As (ppm)	23	62	9	0
F (ppm)	72	39	100	160
Hg (ppm)	.40	1.30	.68	.23
Sb (ppm)	.62	1.50	1.32	B
Se (ppm-S)	6.9	8.0	2.1	3.6
Th (ppm)	6.95	8.66	7.04	4.42
U (ppm)	.57	.43	1.03	1.98

County	Fayette	Fayette	Fayette	Fayette
Sample number	395109/795232/4	395110/795212/3	395110/795212/5	395110/795212/7
Site number	29-11	29-12	29-12	29-12
Ash (%)	9.1	21.9	9.5	6.7
SiO_2 (%)	38.4	57.8	55.8	48.9
Al_2O_3 (%)	26.8	23.7	27.9	28.7
CaO (%)	4.75	.24	1.10	3.20
MgO (%)	1.28	.94	.83	1.05
Na_2O (%)	.58	.34	.24	.61
K_2O (%)	1.98	3.30	2.59	2.24
Fe_2O_3 (%)	9.3	2.9	2.4	2.8
TiO_2 (%)	1.11	1.20	1.21	1.61
P_2O_5 (%)	.10L	1.00L	1.00L	1.00L
SO_3 (%)	6.25	.20L	2.33	5.98
Ag (ppm-S)	.51	.86	.46L	.46L
B (ppm-S)	285	142	193	321
Ba (ppm-S)	1480	666	1190	1450
Be (ppm-S)	13	27	33	16
Bi (ppm-S)	4.64L	4.64L	4.64L	4.64L
Cd (ppm)	.16	7.50	6.60	7.40
Ce (ppm-S)	195	170	146	201
Co (ppm-S)	18	15	39	57
Cr (ppm-S)	150	175	184	242
Cu (ppm)	41	29	28	48
Dy (ppm-S)	14.70L	16.80	19.50	20.10
Er (ppm-S)	9.78	19.10	18.50	9.12
Eu (ppm-S)	5.79	2.40	5.31	4.04
Ga (ppm-S)	50	79	82	58
Gd (ppm-S)	23.50	14.70L	26.90	18.30
Ge (ppm-S)	7	240	39	6
Ho (ppm-S)	14.70L	10.00L	3.16L	3.18
La (ppm-S)	104	88	80	104
Li (ppm)	130	170	190	200
Mn (ppm-S)	159	195	220	1180
Mo (ppm-S)	4	12	11	7
Nb (ppm-S)	16	34	20	26
Nd (ppm-S)	68L	108	72	94
Ni (ppm-S)	121	86	125	128
Pb (ppm)	20L	56	56	52
Pr (ppm-S)	14.60	12.70	13.60	17.90
Sc (ppm-S)	32	32	38	38
Sm (ppm-S)	9.56	11.00	9.82	13.50
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	614	512	944	1660
Tl (ppm-S)	5.52	4.64L	6.32	4.64L
V (ppm-S)	164	383	227	154
Y (ppm-S)	97	110	115	93
Yb (ppm-S)	9.42	13.60	12.60	8.84
Zn (ppm-S)	180	100	170	160
Zr (ppm-S)	292.00	1640.00	336.00	621.00
As (ppm)	0	4	2	1
F (ppm)	49	150	52	31
Hg (ppm)	.41	.10	.10	.19
Sb (ppm)	B	.55	.18	.12
Se (ppm-S)	1.7	3.7	1.2	1.1
Th (ppm)	B	B	B	B
U (ppm)	.88	2.28	1.34	.76

County	Fayette	Fayette	Fayette	Fayette
Sample number	395936/795530/1	395936/795530/3	395936/795530/5	400307/792703/2
Site number	29-18	29-18	29-18	48-7
Ash (%)	11.8	15.9	28.5	7.0
SiO_2 (%)	31.2	46.9	50.7	30.2
Al_2O_3 (%)	17.3	22.3	22.1	26.1
CaO (%)	.52	1.60	1.20	1.55
MgO (%)	.38	.78	1.01	.51
Na_2O (%)	.18	.27	.26	.24
K_2O (%)	1.11	2.25	2.32	1.38
Fe_2O_3 (%)	44.5	16.5	15.1	30.5
TiO_2 (%)	.67	1.10	1.12	1.06
P_2O_5 (%)	1.00L	1.67	1.00L	.10L
SO_3 (%)	1.33	1.54	1.98	1.19
Ag (ppm-S)	.70	.46L	.46L	.84
B (ppm-S)	224	292	141	94
Ba (ppm-S)	307	1890	917	205
Be (ppm-S)	18	15	13	15
Bi (ppm-S)	4.64L	8.44	4.64L	4.64L
Cd (ppm)	5.00	6.40	4.80	.63
Ce (ppm-S)	363	233	215	281
Co (ppm-S)	87	82	48	29
Cr (ppm-S)	156	222	226	122
Cu (ppm)	73	69	78	120
Dy (ppm-S)	6.81L	14.70L	6.81L	14.70L
Er (ppm-S)	4.64L	16.70	4.64L	4.64L
Eu (ppm-S)	1.46	3.10	1.97	2.70
Ga (ppm-S)	52	78	67	37
Gd (ppm-S)	14.70L	20.90	25.50	21.50L
Ge (ppm-S)	9	5	5	3L
Ho (ppm-S)	3.16L	6.48	3.16L	68.10L
La (ppm-S)	71	111	91	60
Li (ppm)	150	170	320	130
Mn (ppm-S)	389	1190	307	59
Mo (ppm-S)	56	23	18	25
Nb (ppm-S)	23	32	16	15L
Nd (ppm-S)	68L	106	68L	68L
Ni (ppm-S)	199	152	132	219
Pb (ppm)	96	40	88	37
Pr (ppm-S)	14.70	17.50	16.30	13.30
Sc (ppm-S)	35	36	34	23
Sm (ppm-S)	9.52	14.00	9.94	6.81L
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	608	2150G	2520	237
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	181	285	180	142
Y (ppm-S)	91	104	66	60
Yb (ppm-S)	7.00	5.55	5.15	6.48
Zn (ppm-S)	110	60	74	110
Zr (ppm-S)	563.00	783.00	374.00	346.00
As (ppm)	106	9	20	0
F (ppm)	33	200	230	34
Hg (ppm)	.30	.32	.33	.79
Sb (ppm)	1.60	.45	1.00	B
Se (ppm-S)	7.3	3.2	5.3	1.9
Th (ppm)	6.42	B	7.33	B
U (ppm)	.49	.80	1.86	.45

County	Fayette	Greene	Greene	Greene
Sample number	400310/792703/2	394516/795652/1A	394517/795652/1	394540/800028/2
Site number	48-7	29-8	29-8	19-3
Ash (%)	9.0	8.0	9.1	16.0
SiO_2 (%)	22.3	44.9	45.5	43.1
Al_2O_3 (%)	20.4	27.7	29.9	27.6
CaO (%)	1.46	.61	.79	.48
MgO (%)	.32	.58	.56	.66
Na_2O (%)	.20	.55	.58	.38
K_2O (%)	.61	2.11	2.01	2.31
Fe_2O_3 (%)	43.4	12.8	5.5	12.8
TiO_2 (%)	.95	1.06	1.05	1.37
P_2O_5 (%)	.16	.37	.73	.10L
SO_3 (%)	1.06	.10L	.10L	.10L
Ag (ppm-S)	.80	.46L	.46L	.46L
B (ppm-S)	45	318	319	237
Ba (ppm-S)	184	546	699	615
Be (ppm-S)	16	8	8	11
Bi (ppm-S)	4.64L	4.64L	4.64L	4.65
Cd (ppm)	.54	.60	.35	.22
Ce (ppm-S)	43L	182	138	197
Co (ppm-S)	42	22	30	17
Cr (ppm-S)	98	125	129	210
Cu (ppm)	180	50	82	60
Dy (ppm-S)	14.70L	14.70L	18.40	14.70L
Er (ppm-S)	4.64L	4.64L	7.87	11.20
Eu (ppm-S)	2.76	1.72	2.21	3.09
Ga (ppm-S)	44	31	32	48
Gd (ppm-S)	21.50L	21.50L	21.50L	21.50L
Ge (ppm-S)	3L	3L	4	5
Ho (ppm-S)	3.16	3.16L	3.16L	14.70L
La (ppm-S)	58	62	55	66
Li (ppm)	94	100	230	150
Mn (ppm-S)	52	80	113	115
Mo (ppm-S)	32	9	2	5
Nb (ppm-S)	15L	15L	15L	17
Nd (ppm-S)	68L	68L	68L	68L
Ni (ppm-S)	105	78	80	68
Pb (ppm)	84	39	43	32
Pr (ppm-S)	14.10	11.10	10.00L	10.00L
Sc (ppm-S)	18	21	21	31
Sm (ppm-S)	6.81L	6.98	6.81L	7.33
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	319	603	1610	395
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	97	149	160	231
Y (ppm-S)	59	39	38	53
Yb (ppm-S)	4.58	5.15	5.26	7.21
Zn (ppm-S)	110	110	130	110
Zr (ppm-S)	407.00	192.00	145.00	280.00
As (ppm)	0	0	0	0
F (ppm)	36	20L	80	84
Hg (ppm)	1.60	.17	.03	.12
Sb (ppm)	B	0	B	B
Se (ppm-S)	5.7	2.4	2.2	2.5
Th (ppm)	B	B	B	5.65
U (ppm)	.48	.58	.51	1.29

County	Greene	Indiana	Indiana	Indiana
Sample number	394540/800028/4	403627/790235/2A	403627/790235/2B	403645/790412/2A
Site number	19-3	56-10	56-10	56-11
Ash (%)	12.5	9.2	43.4	11.2
SiO_2 (%)	42.7	39	53	10
Al_2O_3 (%)	25.6	23	26	10
CaO (%)	.62	2.0	.3	3.3
MgO (%)	.71	.41	.95	.27
Na_2O (%)	.26	.15	.18	.16
K_2O (%)	2.30	1.1	4.1	.2
Fe_2O_3 (%)	15.8	16	6	56
TiO_2 (%)	.97	1.5	1.40	.30
P_2O_5 (%)	.10L	1.0L	1.0L	1.0L
SO_3 (%)	.27	2.8	.8	4.1
Ag (ppm-S)	.46L	N	N	N
B (ppm-S)	319	70	100	0
Ba (ppm-S)	534	200	300	100
Be (ppm-S)	9	15	7	7
Bi (ppm-S)	4.64L	N	N	N
Cd (ppm)	.30	1.00L	1.00L	1.00L
Ce (ppm-S)	184	0	N	N
Co (ppm-S)	21	20	10L	15
Cr (ppm-S)	127	150	150	20
Cu (ppm)	50	100	32	40
Dy (ppm-S)	14.70L	N	B	B
Er (ppm-S)	8.42	N	B	B
Eu (ppm-S)	2.20	N	N	N
Ga (ppm-S)	34	B	B	B
Gd (ppm-S)	21.50L	N	B	B
Ge (ppm-S)	3L	N	N	N
Ho (ppm-S)	14.70L	N	B	B
La (ppm-S)	47	100L	100L	N
Li (ppm)	130	137	288	30
Mn (ppm-S)	157	70	50	30
Mo (ppm-S)	2L	7	N	10
Nb (ppm-S)	15L	50	50	N
Nd (ppm-S)	68L	150L	N	B
Ni (ppm-S)	61	50	15	50
Pb (ppm)	25	60	50	45
Pr (ppm-S)	10.00	N	N	B
Sc (ppm-S)	20	30	30	10L
Sm (ppm-S)	6.81L	N	N	B
Sn (ppm-S)	14.70L	N	N	N
Sr (ppm-S)	434	700	200	300
Tl (ppm-S)	4.64L	N	N	N
V (ppm-S)	133	150	200	50
Y (ppm-S)	39	70	30	20
Yb (ppm-S)	5.56	7.00	3.00	B
Zn (ppm-S)	57	132	44	76
Zr (ppm-S)	186.00	200.00	200.00	30.00
As (ppm)	0	5	10	30
F (ppm)	74	35	260	20L
Hg (ppm)	.08	.12	.16	.59
Sb (ppm)	B	.50	2.80	.60
Se (ppm-S)	.7	3.2	6.1	3.6
Th (ppm)	B	3.65	13.35	1.15
U (ppm)	.95	.85	3.65	.20

County	Indiana	Indiana	Indiana	Indiana
Sample number	403645/790412/2B	403647/790409/2A	403647/790409/2B	403811/790332/2
Site number	56-11	56-12	56-12	56-13
Ash (%)	60.9	10.8	47.5	16.8
SiO_2 (%)	43	21	44	44
Al_2O_3 (%)	21	15	20	23
CaO (%)	.36	1.1	.24	.9
MgO (%)	.83	.37	.86	.68
Na_2O (%)	.22	.18	.23	.16
K_2O (%)	3.3	.92	3.2	2.3
Fe_2O_3 (%)	21	38	16	18
TiO_2 (%)	1.1	.77	.97	1.50
P_2O_5 (%)	1.0L	1.0L	1.0L	1.0L
SO_3 (%)	2.1	1.6	.9	1.6
Ag (ppm-S)	N	1.00	N	N
B (ppm-S)	50	0	70	70
Ba (ppm-S)	300	150	300	700
Be (ppm-S)	3	15	5	7
Bi (ppm-S)	N	N	N	N
Cd (ppm)	1.00L	1.00	1.00L	1.00L
Ce (ppm-S)	N	0	N	0
Co (ppm-S)	10	50	10	15
Cr (ppm-S)	70	150	70	100
Cu (ppm)	40	132	40	64
Dy (ppm-S)	B	N	B	B
Er (ppm-S)	B	N	B	B
Eu (ppm-S)	N	N	N	N
Ga (ppm-S)	B	B	B	B
Gd (ppm-S)	B	N	B	B
Ge (ppm-S)	N	N	N	N
Ho (ppm-S)	B	N	B	B
La (ppm-S)	100L	100L	100L	100L
Li (ppm)	164	65	222	244
Mn (ppm-S)	500	50	300	70
Mo (ppm-S)	10	15	10	7
Nb (ppm-S)	20	30	30	30
Nd (ppm-S)	150L	150L	N	150L
Ni (ppm-S)	30	150	30	70
Pb (ppm)	35	225	55	50
Pr (ppm-S)	N	N	N	N
Sc (ppm-S)	15	70	15	20
Sm (ppm-S)	N	N	N	N
Sn (ppm-S)	N	N	N	N
Sr (ppm-S)	150	700	300	500
Tl (ppm-S)	N	N	N	N
V (ppm-S)	100	500	150	150
Y (ppm-S)	20	70	30	50
Yb (ppm-S)	B	B	B	7.00
Zn (ppm-S)	66	314	60	116
Zr (ppm-S)	150.00	150.00	150.00	200.00
As (ppm)	120	30	100	8
F (ppm)	300	25	255	80
Hg (ppm)	3.30	.70	2.00	.40
Sb (ppm)	.20	3.50	2.40	.70
Se (ppm-S)	18.1	3.4	18.3	5.1
Th (ppm)	13.08	3.43	13.10	5.36
U (ppm)	4.40	1.51	3.44	1.23

County	Indiana	Jefferson	Jefferson	Jefferson
Sample number	403821/790341/2	410555/791233/2A	410555/791233/2B	410556/791233/2A
Site number	56-14	54-13	54-13	54-14
Ash (%)	10.1	10.5	18.6	14.7
SiO_2 (%)	32	43.3	33.8	55.4
Al_2O_3 (%)	20.0	30.6	24.4	26.9
CaO (%)	1.0	1.90	.41	.26
MgO (%)	.33	.96	.61	1.06
Na_2O (%)	.13	.32	.22	.34
K_2O (%)	.72	2.47	1.69	3.18
Fe_2O_3 (%)	28	13.3	31.4	7.1
TiO_2 (%)	1.4	.99	1.20	1.36
P_2O_5 (%)	1.0L	1.00L	1.00L	1.00L
SO_3 (%)	1.9	2.17	1.04	.80
Ag (ppm-S)	N	.46L	.48	.46L
B (ppm-S)	50	288	100	211
Ba (ppm-S)	300	623	308	527
Be (ppm-S)	10	17	18	12
Bi (ppm-S)	N	4.64L	4.64L	4.64L
Cd (ppm)	1.00L	11.00	11.00	11.00
Ce (ppm-S)	0	328	295	144
Co (ppm-S)	20	86	104	83
Cr (ppm-S)	100	179	110	199
Cu (ppm)	110	82	340	140
Dy (ppm-S)	N	47.80	14.70L	6.81L
Er (ppm-S)	N	16.70	27.50	5.32
Eu (ppm-S)	N	4.39	3.08	3.69
Ga (ppm-S)	B	48	75	46
Gd (ppm-S)	N	26.40	14.70L	22.00
Ge (ppm-S)	N	3L	125	15
Ho (ppm-S)	N	5.51	3.16L	3.50
La (ppm-S)	100	169	97	70
Li (ppm)	123	400	340	180
Mn (ppm-S)	150	131	384	133
Mo (ppm-S)	15	12	50	15
Nb (ppm-S)	50	20	24	14
Nd (ppm-S)	150	171	83	68L
Ni (ppm-S)	100	160	98	126
Pb (ppm)	90	88	110	40
Pr (ppm-S)	N	27.80	16.70	10.10
Sc (ppm-S)	20	32	32	26
Sm (ppm-S)	N	18.40	10.20	7.12
Sn (ppm-S)	N	14.70L	14.70L	14.70L
Sr (ppm-S)	700	2780	967	1730
Tl (ppm-S)	N	4.64L	58.90	4.64L
V (ppm-S)	150	174	255	102
Y (ppm-S)	70	110	190	50
Yb (ppm-S)	B	5.85	8.38	8.21
Zn (ppm-S)	176	260	240	170
Zr (ppm-S)	200.00	449.00	595.00	189.00
As (ppm)	15	5	37	7
F (ppm)	30	140	61	85
Hg (ppm)	.25	.13	.94	.09
Sb (ppm)	1.00	.30	2.37	.46
Se (ppm-S)	3.2	2.2	6.7	2.4
Th (ppm)	1.77	B	B	6.50
U (ppm)	.83	1.01	2.82	1.34

County	Jefferson	Jefferson	Jefferson	Jefferson
Sample number	410556/791233/2B	410556/791233/2C	410556/791233/2D	410816/791013/2A
Site number	54-14	54-14	54-14	54-16
Ash (%)	3.1	22.9	10.3	8.2
SiO_2 (%)	28.6	47.0	40.3	18.9
Al_2O_3 (%)	19.0	30.0	31.9	18.0
CaO (%)	1.40	.20	.70	1.96
MgO (%)	.76	1.16	.63	.28
Na_2O (%)	.40	.26	.26	.12
K_2O (%)	1.84	3.79	1.95	.23
Fe_2O_3 (%)	27.9	7.8	17.3	51.3
TiO_2 (%)	1.07	1.70	1.50	.48
P_2O_5 (%)	1.00L	1.00L	1.00L	.10L
SO_3 (%)	2.60	.89	.95	2.23
Ag (ppm-S)	.89	.46L	.70	.77
B (ppm-S)	464G	166	235	252
Ba (ppm-S)	451	504	502	176
Be (ppm-S)	15	7	21	39
Bi (ppm-S)	4.64L	4.64L	4.64L	4.64L
Cd (ppm)	5.30	6.40	6.80	.25
Ce (ppm-S)	246	168	404	43L
Co (ppm-S)	118	27	27	60
Cr (ppm-S)	131	178	224	83
Cu (ppm)	260	77	430	120
Dy (ppm-S)	6.81L	6.81L	14.70L	14.70L
Er (ppm-S)	4.64L	9.66	22.30	20.80
Eu (ppm-S)	2.35	1.88	5.04	3.62
Ga (ppm-S)	50	57	78	79
Gd (ppm-S)	14.70L	17.70	32.90	14.70L
Ge (ppm-S)	5	3L	10	25
Ho (ppm-S)	3.16L	3.16L	3.16L	3.16L
La (ppm-S)	80	81	166	40
Li (ppm)	93	450	400	44
Mn (ppm-S)	127	104	118	119
Mo (ppm-S)	84	5	54	25
Nb (ppm-S)	18	17	23	15L
Nd (ppm-S)	68L	68L	207	68L
Ni (ppm-S)	200	135	104	165
Pb (ppm)	110	72	130	65
Pr (ppm-S)	15.60	12.00	24.90	16.10
Sc (ppm-S)	33	30	38	23
Sm (ppm-S)	11.10	10.60	22.60	8.01
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	949	1120	2870	229
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	112	133	469	117
Y (ppm-S)	83	47	114	130
Yb (ppm-S)	4.55	6.01	8.89	10.60
Zn (ppm-S)	160	120	70	130
Zr (ppm-S)	401.00	355.00	667.00	398.00
As (ppm)	20	6	11	0
F (ppm)	23	160	76	29
Hg (ppm)	.33	.20	.25	.16
Sb (ppm)	.35	.77	2.09	B
Se (ppm-S)	2.3	3.1	5.8	2.2
Th (ppm)	B	7.26	B	B
U (ppm)	.46	1.96	2.37	.50

County	Jefferson	Jefferson	Jefferson	Jefferson
Sample number	410816/791013/2B	410812/785224/1A	410812/785224/1B	410812/785224/2A
Site number	54-16	64-47	64-47	64-47
Ash (%)	15.0	14.4	12.3	9.1
SiO_2 (%)	22.9	37.0	36.0	38.0
Al_2O_3 (%)	12.9	16.0	19.0	24.0
CaO (%)	2.19	.62	1.50	2.10
MgO (%)	.22	.50	.33	.71
Na_2O (%)	.13	.11	.23	.61
K_2O (%)	.51	1.20	.97	1.80
Fe_2O_3 (%)	53.4	36.0	32	19.0
TiO_2 (%)	.89	.73	.90	1.80
P_2O_5 (%)	.10L	1.00L	1.00L	1.00L
SO_3 (%)	2.11	1.30	1.20	4.30
Ag (ppm-S)	.58	1.81	.62	.79
B (ppm-S)	168	111	108	150
Ba (ppm-S)	103	340	736	684
Be (ppm-S)	25	26	11	17
Bi (ppm-S)	4.64L	4.64L	4.64L	4.78
Cd (ppm)	.64	2.00	2.60	5.40
Ce (ppm-S)	43L	43L	43L	235
Co (ppm-S)	40	99	19	22
Cr (ppm-S)	65	128	85	169
Cu (ppm)	71	120	86	140
Dy (ppm-S)	14.70L	14.70L	14.70L	14.70L
Er (ppm-S)	4.64L	15.10	4.64L	13.40
Eu (ppm-S)	1.00L	1.00L	1.25	4.33
Ga (ppm-S)	24	89	38	58
Gd (ppm-S)	21.50L	21.50L	21.50L	21.50L
Ge (ppm-S)	3L	228	3L	10
Ho (ppm-S)	3.16L	3.16L	3.16L	3.16L
La (ppm-S)	45	43	31	108
Li (ppm)	94	110	150	160
Mn (ppm-S)	85	65	52	155
Mo (ppm-S)	23	30	17	35
Nb (ppm-S)	15L	19	15L	21
Nd (ppm-S)	68L	68L	68L	68L
Ni (ppm-S)	87	254	53	102
Pb (ppm)	20L	430	150	82
Pr (ppm-S)	13.60	15.50	10.50	18.40
Sc (ppm-S)	12	39	12	18
Sm (ppm-S)	6.81L	6.81L	6.81L	10.40
Sn (ppm-S)	20.50	14.70L	14.70L	14.70L
Sr (ppm-S)	186	323	1300	619
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	75	487	99	181
Y (ppm-S)	64	107	24	87
Yb (ppm-S)	3.20	9.58	2.85	9.23
Zn (ppm-S)	86	210	54	120
Zr (ppm-S)	380.00	380.00	84.30	284.00
As (ppm)	0	294	73	15
F (ppm)	23	50	120	49
Hg (ppm)	.50	1.10	.41	.38
Sb (ppm)	B	8.55	.72	.50
Se (ppm-S)	3.9	7.7	3.7	2.4
Th (ppm)	B	B	B	7.38
U (ppm)	.55	1.65	.61	.97

County	Venango	Venango	Washington	Washington
Sample number	411245/794104/2A	411245/794104/2B	401940/803050/2	401940/803050/4
Site number	34-25	34-25	7-11	7-11
Ash (%)	10.8	29.0	6.3	8.2
SiO_2 (%)	25.0	18.4	56.2	51.4
Al_2O_3 (%)	16.6	7.4	23.2	30.1
CaO (%)	1.32	.42	.79	.68
MgO (%)	.30	.30	.89	.76
Na_2O (%)	.16	.14	.31	.27
K_2O (%)	.57	.56	2.19	1.65
Fe_2O_3 (%)	48.2	65.9	10.0	9.9
TiO_2 (%)	.74	.59	1.11	1.01
P_2O_5 (%)	.10L	.10L	1.00L	1.00L
SO_3 (%)	.94	.77	1.47	1.21
Ag (ppm-S)	.72	.48	.46L	1.17
B (ppm-S)	343	146	464G	464G
Ba (ppm-S)	262	289	403	277
Be (ppm-S)	37	21	48	18
Bi (ppm-S)	4.64L	14.70	4.64L	4.64L
Cd (ppm)	.90	.30	1.60	1.60
Ce (ppm-S)	438	43L	225	198
Co (ppm-S)	84	20	123	94
Cr (ppm-S)	85	63	222	358
Cu (ppm)	110	29	73	120
Dy (ppm-S)	14.70L	14.70L	43.20	6.81L
Er (ppm-S)	24.00	4.64L	12.00	8.48
Eu (ppm-S)	6.05	1.00L	3.25	3.91
Ga (ppm-S)	50	28	59	89
Gd (ppm-S)	14.70L	21.50L	24.10	14.70L
Ge (ppm-S)	62	3L	50	11
Ho (ppm-S)	31.60L	3.16L	5.56	3.83
La (ppm-S)	100	31	119	82
Li (ppm)	88	84	110	210
Mn (ppm-S)	92	1480	238	150
Mo (ppm-S)	43	15	63	23
Nb (ppm-S)	19	15L	43	22
Nd (ppm-S)	68L	68L	84	68L
Ni (ppm-S)	185	32	299	249
Pb (ppm)	96	20L	16	92
Pr (ppm-S)	21.90	14.90	18.80	14.90
Sc (ppm-S)	22	7	40	70
Sm (ppm-S)	13.10	6.81L	14.70	10.40
Sn (ppm-S)	14.70L	18.70	14.70L	14.70L
Sr (ppm-S)	167	78	633	548
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	100	37	251	341
Y (ppm-S)	166	39	136	86
Yb (ppm-S)	11.90	3.18	5.82	5.59
Zn (ppm-S)	280	64	130	170
Zr (ppm-S)	486.00	73.10	1030.00	522.00
As (ppm)	0	0	5	2
F (ppm)	43	20L	58	44
Hg (ppm)	.47	1.60	.04	.03
Sb (ppm)	B	B	.41	.42
Se (ppm-S)	3.5	5.5	.9	1.5
Th (ppm)	B	4.73	B	B
U (ppm)	.75	.59	.46	.66

County	Washington	Washington	Washington	Washington
Sample number	401940/803050/6	401940/803050/9	402134/802938/3	402134/802938/5
Site number	7-11	7-11	7-12	7-12
Ash (%)	4.2	29.7	11.5	6.8
SiO_2 (%)	38.8	53.0	25.8	23.9
Al_2O_3 (%)	23.2	19.3	12.7	16.7
CaO (%)	3.00	.34	.86	1.94
MgO (%)	.56	1.11	1.09	1.03
Na_2O (%)	.40	.23	.28	.30
K_2O (%)	.93	2.58	1.14	.71
Fe_2O_3 (%)	27.2	16.4	50.5	46.3
TiO_2 (%)	.92	1.02	.56	.66
P_2O_5 (%)	1.00L	1.00L	.10L	.10L
SO_3 (%)	2.74	1.42	.62	1.85
Ag (ppm-S)	.63	.46L	.57	.62
B (ppm-S)	464G	185	352	464G
Ba (ppm-S)	400	355	136	431
Be (ppm-S)	36	13	11	7
Bi (ppm-S)	4.64L	4.64L	4.64L	4.64L
Cd (ppm)	4.10	7.10	.72	1.10
Ce (ppm-S)	219	135	43L	43L
Co (ppm-S)	58	43	13	18
Cr (ppm-S)	172	138	61	74
Cu (ppm)	90	68	70	60
Dy (ppm-S)	6.81L	6.81L	14.70L	14.70L
Er (ppm-S)	4.64L	4.64L	4.64L	6.83
Eu (ppm-S)	4.13	1.80	1.00L	1.31
Ga (ppm-S)	113	54	32	28
Gd (ppm-S)	14.70L	14.70L	21.50L	21.50L
Ge (ppm-S)	14	9	73	3L
Ho (ppm-S)	3.16L	3.16L	3.16L	3.16L
La (ppm-S)	108	56	15L	42
Li (ppm)	90	93	160	80
Mn (ppm-S)	186	272	92	141
Mo (ppm-S)	53	6	11	10
Nb (ppm-S)	17	14	15L	15L
Nd (ppm-S)	68L	68L	68L	68L
Ni (ppm-S)	309	188	56	63
Pb (ppm)	84	88	38	34
Pr (ppm-S)	19.60	7.64	12.30	12.50
Sc (ppm-S)	38	34	10	15
Sm (ppm-S)	12.40	6.35	6.81L	6.81L
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	1460	330	109	263
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	165	104	50	92
Y (ppm-S)	153	52	17	31
Yb (ppm-S)	9.18	4.57	2.40	3.26
Zn (ppm-S)	150	200	290	94
Zr (ppm-S)	588.00	330.00	48.20	77.40
As (ppm)	12	34	0	0
F (ppm)	60	160	53	33
Hg (ppm)	.19	.34	.12	.13
Sb (ppm)	.47	1.90	B	B
Se (ppm-S)	1.8	2.5	1.3	1.8
Th (ppm)	B	9.17	B	B
U (ppm)	B	1.55	B	B

County	Washington	Washington	Washington	Washington
Sample number	402134/802938/7	402137/802938/4	402137/802938/6	402137/802938/8
Site number	7-12	7-13	7-13	7-13
Ash (%)	27.5	9.2	8.8	27.6
SiO_2 (%)	31.5	35.4	29.3	42.6
Al_2O_3 (%)	15.6	18.4	17.4	20.4
CaO (%)	5.77	.87	1.55	.37
MgO (%)	1.01	.68	.60	.98
Na_2O (%)	.61	.30	.53	.26
K_2O (%)	1.98	1.45	1.14	2.59
Fe_2O_3 (%)	30.9	33.5	39.7	20.9
TiO_2 (%)	.68	.75	.69	.91
P_2O_5 (%)	.10L	.10L	.21	.10L
SO_3 (%)	3.71	.34	1.72	.33
Ag (ppm-S)	.46L	.57	.46L	.46L
B (ppm-S)	199	437	464G	226
Ba (ppm-S)	380	202	146	463
Be (ppm-S)	9	12	8	8
Bi (ppm-S)	4.64L	9.09	4.64L	4.64L
Cd (ppm)	.98	.86	.70	.72
Ce (ppm-S)	63L	43L	140	121
Co (ppm-S)	31	19	9	22
Cr (ppm-S)	97	86	46	139
Cu (ppm)	53	65	42	56
Dy (ppm-S)	14.70L	14.70L	14.70L	14.70L
Er (ppm-S)	4.64L	4.64L	4.64L	4.64L
Eu (ppm-S)	1.75	2.57	1.00L	1.40
Ga (ppm-S)	48	38	33	63
Gd (ppm-S)	14.70L	21.50L	14.70L	21.50L
Ge (ppm-S)	14	21	3L	18
Ho (ppm-S)	3.16L	3.16L	3.16L	3.16L
La (ppm-S)	18	31	20	15L
Li (ppm)	74	88	53	110
Mn (ppm-S)	745	85	92	133
Mo (ppm-S)	8	18	5	5
Nb (ppm-S)	15L	15L	15L	15L
Nd (ppm-S)	68L	68L	68L	68L
Ni (ppm-S)	78	71	31	97
Pb (ppm)	38	32	29	89
Pr (ppm-S)	10.00L	11.20	10.00L	10.00L
Sc (ppm-S)	12	16	8	17
Sm (ppm-S)	6.81L	6.81L	6.81L	6.81L
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	154	145	205	117
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	112	95	49	155
Y (ppm-S)	25	28	24	21
Yb (ppm-S)	6.78	3.77	2.01	7.56
Zn (ppm-S)	200	99	73	160
Zr (ppm-S)	144.00	68.70	61.90	95.80
As (ppm)	0	0	0	0
F (ppm)	120	48	46	150
Hg (ppm)	.33	.06	.23	.17
Sb (ppm)	B	B	B	B
Se (ppm-S)	1.9	1.1	1.9	2.1
Th (ppm)	5.53	B	B	6.42
U (ppm)	1.90	.58	B	1.90

County	Washington	Washington	Washington	Washington
Sample number	402212/801822/5	402212/801822/7	402257/801656/2	402257/801656/4
Site number	7-14	7-14	7-16	7-16
Ash (%)	21.5	15.0	9.1	7.1
SiO_2 (%)	43.0	42.7	30.8	38.7
Al_2O_3 (%)	24.4	29.8	15.9	24.5
CaO (%)	.39	3.67	.69	.98
MgO (%)	.88	.85	.45	.55
Na_2O (%)	.27	.73	.24	.28
K_2O (%)	2.75	2.52	1.30	1.09
Fe_2O_3 (%)	16.2	3.6	44.0	27.9
TiO_2 (%)	1.09	1.14	.83	1.05
P_2O_5 (%)	.10L	1.72	1.00L	1.00L
SO_3 (%)	.30	.20	1.34	1.67
Ag (ppm-S)	.46L	.46L	.57	.46L
B (ppm-S)	219	285	363	464G
Ba (ppm-S)	321	710	193	329
Be (ppm-S)	12	10	27	17
Bi (ppm-S)	4.64L	4.64L	4.64L	4.64L
Cd (ppm)	.84	.72	12.00	7.20
Ce (ppm-S)	129	170	43L	282
Co (ppm-S)	27	34	36	54
Cr (ppm-S)	173	174	99	150
Cu (ppm)	10L	10L	54	94
Dy (ppm-S)	14.70L	14.70L	14.70L	6.81L
Er (ppm-S)	6.25	5.82	21.50	4.64L
Eu (ppm-S)	2.38	3.46	1.00L	2.34
Ga (ppm-S)	79	43	52	47
Gd (ppm-S)	21.50L	21.50L	20.40	14.70L
Ge (ppm-S)	30	12	22	5
Ho (ppm-S)	3.16L	5.56	3.16L	3.16L
La (ppm-S)	30	45	5L	82
Li (ppm)	140	210	67	160
Mn (ppm-S)	130	304	103	276
Mo (ppm-S)	8	2L	26	27
Nb (ppm-S)	15L	15L	14	38
Nd (ppm-S)	68L	68L	68L	68L
Ni (ppm-S)	111	75	96	159
Pb (ppm)	57	51	100	110
Pr (ppm-S)	10.00L	10.20	10.60	16.80
Sc (ppm-S)	28	23	28	27
Sm (ppm-S)	6.81L	6.81L	6.66	12.10
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	228	919	498	750
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	161	155	152	151
Y (ppm-S)	32	38	89	103
Yb (ppm-S)	8.78	7.70	6.80	4.41
Zn (ppm-S)	140	150	140	150
Zr (ppm-S)	63.70	96.50	410.00	700.00
As (ppm)	0	0	62	82
F (ppm)	130	230	34	38
Hg (ppm)	.20	.04	.10	.13
Sb (ppm)	B	B	.63	.81
Se (ppm-S)	2.5	.9	1.1	2.2
Th (ppm)	5.24	B	B	B
U (ppm)	1.65	1.13	.51	.54

County	Washington	Washington	Washington	Washington
Sample number	402257/801656/6	402257/801656/8	402257/801656/16	400354/800005/2
Site number	7-16	7-16	7-16	18-7
Ash (%)	12.4	30.9	21.8	26.5
SiO_2 (%)	44.2	44.0	40.9	50.9
Al_2O_3 (%)	21.7	19.4	20.9	25.7
CaO (%)	.43	.14	.60	.13
MgO (%)	.51	.78	.70	.94
Na_2O (%)	.36	.38	.34	.27
K_2O (%)	1.76	1.90	2.01	3.00
Fe_2O_3 (%)	25.9	26.8	28.8	7.7
TiO_2 (%)	1.00	.93	.90	1.06
P_2O_5 (%)	1.00L	1.00L	1.00L	.10L
SO_3 (%)	.77	.73	.93	.10L
Ag (ppm-S)	.55	.46L	.46L	.46L
B (ppm-S)	389	170	223	145
Ba (ppm-S)	324	337	381	413
Be (ppm-S)	22	15	17	13
Bi (ppm-S)	4.64L	4.64L	4.64L	4.64L
Cd (ppm)	6.00	13.00	3.90	.32
Ce (ppm-S)	319	248	237	131
Co (ppm-S)	101	89	32	22
Cr (ppm-S)	263	236	120	146
Cu (ppm)	81	56	52	95
Dy (ppm-S)	14.70L	6.81L	14.70L	14.70L
Er (ppm-S)	21.80	4.64L	15.10	8.70
Eu (ppm-S)	4.10	1.00L	1.66	4.76
Ga (ppm-S)	83	51	46	51
Gd (ppm-S)	14.70L	14.70L	14.70L	21.50L
Ge (ppm-S)	8	6	46	14
Ho (ppm-S)	3.16L	10.30	3.16L	3.16L
La (ppm-S)	84	75	83	47
Li (ppm)	120	180	120	270
Mn (ppm-S)	131	235	297	120
Mo (ppm-S)	39	24	56	22
Nb (ppm-S)	21	33	21	15L
Nd (ppm-S)	68L	68L	68L	68L
Ni (ppm-S)	231	170	84	70
Pb (ppm)	100	120	68	42
Pr (ppm-S)	15.80	15.40	13.50	10.00L
Sc (ppm-S)	106	39	25	23
Sm (ppm-S)	11.80	9.00	10.20	6.81L
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	586	406	985	152
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	286	195	195	162
Y (ppm-S)	135	82	71	45
Yb (ppm-S)	14.20	4.52	4.14	9.39
Zn (ppm-S)	160	200	90	120
Zr (ppm-S)	708.00	846.00	483.00	152.00
As (ppm)	23	76	143	0
F (ppm)	74	130	150	180
Hg (ppm)	.18	.36	.33	.18
Sb (ppm)	.79	1.87	2.17	B
Se (ppm-S)	1.6	10.8	2.6	1.3
Th (ppm)	6.15	10.39	B	8.04
U (ppm)	.77	2.60	4.19	2.35

County	Washington	Washington	Washington	Washington
Sample number	400354/800005/4	400354/800005/6	400354/800005/8	400628/800450/4
Site number	18-7	18-7	18-7	18-8
Ash (%)	16.5	14.1	21.7	18.1
SiO_2 (%)	42.8	41.0	46.2	48.2
Al_2O_3 (%)	27.0	27.5	20.0	22.3
CaO (%)	.23	.45	.72	.40
MgO (%)	.66	.68	.93	.63
Na_2O (%)	.22	.30	.03	.32
K_2O (%)	1.96	1.92	2.86	1.71
Fe_2O_3 (%)	15.7	14.4	15.9	20.8
TiO_2 (%)	.95	1.02	.99	1.20
P_2O_5 (%)	.10L	.12	.10L	1.00L
SO_3 (%)	.10L	.40	1.11	.96
Ag (ppm-S)	.46L	.46	.46L	.46L
B (ppm-S)	205	266	174	228
Ba (ppm-S)	297	534	828	528
Be (ppm-S)	21	12	26	15
Bi (ppm-S)	4.64L	4.64L	4.64L	4.64L
Cd (ppm)	.28	.26	.30	6.60
Ce (ppm-S)	211	207	94	222
Co (ppm-S)	42	33	35	29
Cr (ppm-S)	229	155	113	144
Cu (ppm)	110	80	37	83
Dy (ppm-S)	14.70L	14.70L	14.70L	6.81L
Er (ppm-S)	17.80	9.53	4.64L	4.64L
Eu (ppm-S)	4.03	2.78	2.01	1.72
Ga (ppm-S)	89	49	58	50
Gd (ppm-S)	20.50L	21.50L	21.50L	21.10
Ge (ppm-S)	11	3L	23	5
Ho (ppm-S)	14.70L	3.16L	3.16L	3.16L
La (ppm-S)	58	66	15L	79
Li (ppm)	320	240	58	250
Mn (ppm-S)	106	150	480	280
Mo (ppm-S)	28	14	5	12
Nb (ppm-S)	18	15L	15L	27
Nd (ppm-S)	68L	68L	68L	68L
Ni (ppm-S)	88	92	94	87
Pb (ppm)	52	41	24	80
Pr (ppm-S)	11.30	14.20	10.00L	12.40
Sc (ppm-S)	44	31	12	30
Sm (ppm-S)	6.81L	7.21	6.81L	10.20
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	200	378	202	879
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	466	182	124	138
Y (ppm-S)	90	61	27	75
Yb (ppm-S)	14.60	8.17	8.63	4.65
Zn (ppm-S)	200	150	270	41
Zr (ppm-S)	208.00	207.00	84.40	661.00
As (ppm)	0	0	0	34
F (ppm)	88	63	130	84
Hg (ppm)	.20	.15	.16	.26
Sb (ppm)	B	B	B	.79
Se (ppm-S)	3.2	4.7	1.8	5.9
Th (ppm)	16.46	6.25	4.85	B
U (ppm)	3.21	1.21	1.37	1.20

County	Washington	Washington	Washington	Washington
Sample number	400628/800450/6	400634/800439/2	400846/800256/4	400846/800256/7
Site number	18-8	18-9	18-10	18-10
Ash (%)	19.0	16.9	18.6	20.1
SiO_2 (%)	48.5	54.0	39.7	44.8
Al_2O_3 (%)	17.9	26.8	24.7	19.3
CaO (%)	.51	.61	.66	.69
MgO (%)	1.03	.76	.63	1.03
Na_2O (%)	.35	.40	.38	.45
K_2O (%)	2.47	2.17	1.91	2.58
Fe_2O_3 (%)	20.3	9.7	19.6	17.8
TiO_2 (%)	.97	1.42	1.15	.97
P_2O_5 (%)	1.00L	1.00L	.28	.12
SO_3 (%)	1.82	.63	.39	.49
Ag (ppm-S)	.46L	.46L	.46L	.46L
B (ppm-S)	217	219	250	213
Ba (ppm-S)	561	487	545	376
Be (ppm-S)	20	17	6	14
Bi (ppm-S)	4.64L	4.64L	4.64L	4.64L
Cd (ppm)	6.60	9.60	.44	.26
Ce (ppm-S)	138	203	207	129
Co (ppm-S)	53	27	17	22
Cr (ppm-S)	173	156	119	167
Cu (ppm)	62	88	56	60
Dy (ppm-S)	6.81L	14.70L	14.70L	14.70L
Er (ppm-S)	9.97	16.40	14.20	10.40
Eu (ppm-S)	1.96	3.28	2.60	2.86
Ga (ppm-S)	88	53	40	51
Gd (ppm-S)	14.70L	14.70L	21.50L	21.50L
Ge (ppm-S)	19	3	3L	27
Ho (ppm-S)	3.16L	3.61	3.16L	3.16L
La (ppm-S)	53	104	65	24
Li (ppm)	100	320	210	92
Mn (ppm-S)	153	129	116	157
Mo (ppm-S)	18	10	6	5
Nb (ppm-S)	16	25	15L	15L
Nd (ppm-S)	68L	106	68L	68L
Ni (ppm-S)	121	118	66	61
Pb (ppm)	60	64	35	27
Pr (ppm-S)	10.50	16.20	12.40	10.00L
Sc (ppm-S)	38	21	21	18
Sm (ppm-S)	7.59	12.00	7.68	6.81L
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	498	1170	506	216
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	134	126	148	203
Y (ppm-S)	65	94	41	31
Yb (ppm-S)	7.33	4.80	5.42	7.52
Zn (ppm-S)	89	47	34	94
Zr (ppm-S)	327.00	614.00	254.00	162.00
As (ppm)	27	14	0	0
F (ppm)	130	130	110	130
Hg (ppm)	.17	.18	.17	.13
Sb (ppm)	.72	.67	B	B
Se (ppm-S)	2.0	4.4	6.1	2.6
Th (ppm)	6.58	7.18	4.44	4.49
U (ppm)	.66	.97	1.28	1.48

County	Washington	Washington	Washington	Washington
Sample number	400901/800108/2	401013/800308/3	401013/800308/6	400710/795908/2
Site number	18-11	18-12	18-12	28-6
Ash (%)	16.5	15.0	20.4	20.1
SiO_2 (%)	36.9	39.4	48.5	44.9
Al_2O_3 (%)	23.8	25.7	20.3	22.4
CaO (%)	.62	.63	1.74	.34
MgO (%)	.58	.60	1.03	.56
Na_2O (%)	.27	.42	.38	.24
K_2O (%)	1.65	1.70	2.86	2.97
Fe_2O_3 (%)	23.9	19.6	12.8	16.2
TiO_2 (%)	1.02	1.14	1.03	.94
P_2O_5 (%)	.32	.10	.13	.10L
SO_3 (%)	.18	.50	1.27	.10L
Ag (ppm-S)	.46L	.46L	.46L	.46L
B (ppm-S)	214	234	162	149
Ba (ppm-S)	370	508	708	383
Be (ppm-S)	6	6	10	20
Bi (ppm-S)	4.64L	4.64L	4.64L	4.64L
Cd (ppm)	.36	.23	.24	.38
Ce (ppm-S)	140	212	80	126
Co (ppm-S)	17	19	13	43
Cr (ppm-S)	104	130	169	127
Cu (ppm)	53	65	43	41
Dy (ppm-S)	14.70L	14.70L	14.70L	14.70L
Er (ppm-S)	4.64L	9.11	4.64L	5.45
Eu (ppm-S)	1.58	1.97	2.09	2.62
Ga (ppm-S)	38	37	74	45
Gd (ppm-S)	21.50L	21.50L	21.50L	21.50L
Ge (ppm-S)	3L	3L	19	151
Ho (ppm-S)	14.70L	3.16L	3.16L	14.70L
La (ppm-S)	28	54	23	28
Li (ppm)	280	240	81	48
Mn (ppm-S)	124	131	806	130
Mo (ppm-S)	6	5	2L	18
Nb (ppm-S)	15L	15L	15L	15L
Nd (ppm-S)	68L	68L	68L	68L
Ni (ppm-S)	49	60	34	88
Pb (ppm)	27	31	23	72
Pr (ppm-S)	10.00L	11.60	10.00L	10.00L
Sc (ppm-S)	10	21	15	16
Sm (ppm-S)	6.81L	6.81L	6.81L	6.81L
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	449	277	157	129
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	102	134	157	139
Y (ppm-S)	17	35	19	28
Yb (ppm-S)	3.74	5.81	7.21	6.83
Zn (ppm-S)	61	43	88	74
Zr (ppm-S)	59.80	198.00	84.10	68.60
As (ppm)	0	0	0	0
F (ppm)	86	61	140	130
Hg (ppm)	.22	.19	.10	.05
Sb (ppm)	B	B	B	B
Se (ppm-S)	4.1	4.3	3.5	1.9
Th (ppm)	4.81	B	5.51	4.79
U (ppm)	.83	1.17	2.07	1.49

County	Washington	Washington	Washington	Washington
Sample number	400710/795908/4	400710/795908/6	400710/795908/7	400710/795908/9
Site number	28-6	28-6	28-6	28-6
Ash (%)	27.9	15.3	21.5	11.9
SiO_2 (%)	49.4	38.5	46.9	35.4
Al_2O_3 (%)	25.5	28.9	20.6	24.0
CaO (%)	.23	.28	.62	.52
MgO (%)	.88	.86	1.13	.46
Na_2O (%)	.50	.30	.27	.89
K_2O (%)	2.29	1.81	3.18	1.47
Fe_2O_3 (%)	7.8	16.4	16.4	27.6
TiO_2 (%)	1.20	.76	1.05	1.01
P_2O_5 (%)	.10L	.10L	.10L	.10L
SO_3 (%)	.12	.17	.52	.10L
Ag (ppm-S)	.46L	.46L	.46L	.46
B (ppm-S)	143	247	137	245
Ba (ppm-S)	353	351	490	322
Be (ppm-S)	13	10	13	8
Bi (ppm-S)	4.64L	4.64L	4.64L	4.64L
Cd (ppm)	.42	.76	.37	.34
Ce (ppm-S)	156	150	122	226
Co (ppm-S)	26	23	20	25
Cr (ppm-S)	151	102	142	106
Cu (ppm)	28	48	10L	10L
Dy (ppm-S)	14.70L	14.70L	14.70L	14.70L
Er (ppm-S)	9.04	4.78	4.64L	4.64L
Eu (ppm-S)	2.61	2.49	1.73	2.25
Ga (ppm-S)	49	32	51	43
Gd (ppm-S)	21.50L	21.50L	21.50L	21.50L
Ge (ppm-S)	5	3	19	3L
Ho (ppm-S)	14.70L	14.70L	3.16L	31.60L
La (ppm-S)	55	32	15L	32
Li (ppm)	460	300	100	180
Mn (ppm-S)	83	111	201	144
Mo (ppm-S)	8	10	4	7
Nb (ppm-S)	15L	15L	15L	15L
Nd (ppm-S)	68L	68L	68L	68L
Ni (ppm-S)	71	77	61	79
Pb (ppm)	46	37	27	27
Pr (ppm-S)	11.50	10.00L	10.00L	10.00L
Sc (ppm-S)	30	15	14	16
Sm (ppm-S)	6.81L	6.81L	6.81L	6.81L
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	156	161	156	252
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	204	116	199	103
Y (ppm-S)	63	30	22	29
Yb (ppm-S)	8.40	6.18	7.90	4.04
Zn (ppm-S)	110	370	160	52
Zr (ppm-S)	175.00	63.10	78.60	80.40
As (ppm)	0	0	0	0
F (ppm)	140	60	220	46
Hg (ppm)	.21	.09	.08	.08
Sb (ppm)	B	B	B	B
Se (ppm-S)	4.0	2.7	2.4	3.4
Th (ppm)	8.52	3.88	B	B
U (ppm)	2.37	1.38	2.13	.86

County	Westmoreland	Westmoreland	Westmoreland	Westmoreland
Sample number	402139/792411/3A	402139/792411/3B	402139/792411/3C	402139/792411/3D
Site number	47-8	47-8	47-8	47-8
Ash (%)	20.9	21.1	15.4	20.0
SiO_2 (%)	25.5	44.1	44.0	28.8
Al_2O_3 (%)	15.0	26.1	25.3	17.8
CaO (%)	.75	.76	.88	.78
MgO (%)	.48	.83	.78	.60
Na_2O (%)	.19	.27	.22	.20
K_2O (%)	1.80	2.75	2.68	1.56
Fe_2O_3 (%)	46.0	14.4	13.0	40.3
TiO_2 (%)	.76	1.05	1.24	.66
P_2O_5 (%)	.10L	.10L	.11	.10L
SO_3 (%)	.42	.10L	.10L	.57
Ag (ppm-S)	.75	.46L	.46L	.46L
B (ppm-S)	57	102	120	93
Ba (ppm-S)	212	346	389	167
Be (ppm-S)	16	14	11	29
Bi (ppm-S)	4.64L	4.64L	4.64L	4.64L
Cd (ppm)	3.00	.95	.76	1.90
Ce (ppm-S)	43L	82	192	301
Co (ppm-S)	30	27	30	180
Cr (ppm-S)	122	96	143	58
Cu (ppm)	82	74	88	22
Dy (ppm-S)	14.70L	14.70L	14.70L	14.70L
Er (ppm-S)	4.64L	4.64L	6.39	35.10
Eu (ppm-S)	2.06	1.71	2.47	7.75
Ga (ppm-S)	98	37	46	62
Gd (ppm-S)	21.50L	21.50L	21.50L	14.70L
Ge (ppm-S)	292	3	3	100
Ho (ppm-S)	3.16L	14.70L	3.16L	3.16L
La (ppm-S)	24	26	75	72
Li (ppm)	68	140	150	110
Mn (ppm-S)	172	106	98	127
Mo (ppm-S)	31	7	9	26
Nb (ppm-S)	17	15L	15L	15L
Nd (ppm-S)	68L	68L	68L	68L
Ni (ppm-S)	97	77	76	227
Pb (ppm)	55	34	48	210
Pr (ppm-S)	10.80	10.00L	11.50	19.70
Sc (ppm-S)	29	10	31	26
Sm (ppm-S)	6.81L	6.81L	7.51	11.00
Sn (ppm-S)	14.70L	14.70L	14.70L	14.70L
Sr (ppm-S)	148	214	275	120
Tl (ppm-S)	4.64L	4.64L	4.64L	4.64L
V (ppm-S)	142	91	171	58
Y (ppm-S)	52	23	55	161
Yb (ppm-S)	5.02	5.37	6.49	17.80
Zn (ppm-S)	610	380	160	1300
Zr (ppm-S)	293.00	58.30	239.00	66.30
As (ppm)	0	0	0	0
F (ppm)	84	110	90	74
Hg (ppm)	.61	.36	.17	.64
Sb (ppm)	B	B	B	B
Se (ppm-S)	2.9	2.1	2.3	.9
Th (ppm)	6.64	5.35	5.28	5.39
U (ppm)	2.08	1.44	1.36	.93

County	Westmoreland
Sample number	400920/792500/2
Site number	48-8
Ash (%)	7.3
SiO_2 (%)	34.4
Al_2O_3 (%)	23.0
CaO (%)	1.90
MgO (%)	.48
Na_2O (%)	.19
K_2O (%)	1.15
Fe_2O_3 (%)	25.1
TiO_2 (%)	1.14
P_2O_5 (%)	1.18
SO_3 (%)	2.26
Ag (ppm-S)	.50
B (ppm-S)	57
Ba (ppm-S)	623
Be (ppm-S)	20
Bi (ppm-S)	4.64L
Cd (ppm)	12.00
Ce (ppm-S)	230
Co (ppm-S)	55
Cr (ppm-S)	92
Cu (ppm)	110
Dy (ppm-S)	14.70L
Er (ppm-S)	12.10
Eu (ppm-S)	1.88
Ga (ppm-S)	69
Gd (ppm-S)	14.70L
Ge (ppm-S)	40
Ho (ppm-S)	3.16L
La (ppm-S)	77
Li (ppm)	110
Mn (ppm-S)	115
Mo (ppm-S)	62
Nb (ppm-S)	17
Nd (ppm-S)	68L
Ni (ppm-S)	273
Pb (ppm)	220
Pr (ppm-S)	13.00
Sc (ppm-S)	26
Sm (ppm-S)	10.30
Sn (ppm-S)	14.70L
Sr (ppm-S)	2800
Tl (ppm-S)	4.64L
V (ppm-S)	226
Y (ppm-S)	97
Yb (ppm-S)	4.51
Zn (ppm-S)	530
Zr (ppm-S)	525.00
As (ppm)	22
F (ppm)	98
Hg (ppm)	.21
Sb (ppm)	.62
Se (ppm-S)	2.9
Th (ppm)	8.70
U (ppm)	B

OTHER TRACE ELEMENTS

Mno was less than or in several samples very near the lowest detectable value (typically <0.05%).

Cl was less than or in one sample very near the lowest detectable value (typically <0.20%).

Au was always less than the lowest detectable value (typically <10.00 ppm).

Hf was always less than the lowest detectable value (typically <21.50 ppm).

In was always less than the lowest detectable value (typically <4.64 ppm).

Ir was always less than the lowest detectable value (typically <6.81 ppm).

Lu was less than or in several samples very near the lowest detectable value (typically <6.81 ppm).

Os was always less than the lowest detectable value (typically <6.81 ppm).

Pd was always less than the lowest detectable value (typically <0.68 ppm).

Pt was less than or in one sample very near the lowest detectable value (typically <6.81 ppm).

Re was always less than the lowest detectable value (typically <10.00 ppm).

Rh was always less than the lowest detectable value (typically <0.68 ppm).

Ru was always less than the lowest detectable value (typically <0.68 ppm).

Ta was always less than the lowest detectable value (typically <464.0 ppm).

Tb was always less than the lowest detectable value (typically <10.00 ppm).

Te was always less than the lowest detectable value (typically <464.0 ppm).

Tm was less than or in one sample very near the lowest detectable value (typically <3.16 ppm).

W was always less than the lowest detectable value (typically <10.00 ppm).